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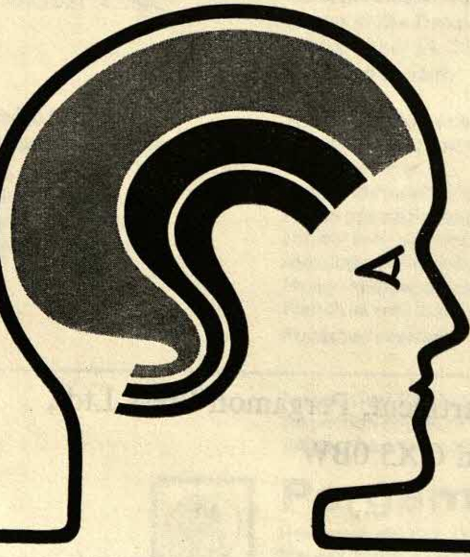

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OBITUARY

DONALD W. WINNICOTT
1896–1971

A CONTEMPORARY of Donald Winnicott, who has also indelibly influenced his generation, dedicated one of his books to ". . . the countless men and women of all creeds or nations or races who fell victims to the fascist and communist belief in Inexorable Laws of Historical Destiny". Winnicott, like Karl Popper in *The Poverty of Historicism*, practised and taught "piecemeal tinkering", and was an enemy of grand schemes that overlook the individual, and his working life illustrated the triumphs and difficulties of those who took account of the unconscious during the last 40 years. We all prefer to keep unconscious whatever we, and Society, have for good reasons repressed, and it is a proper compliment to consider what were his difficulties in unveiling the unwelcome repressed, how he approached them, and what we can learn from his example.

In individual analysis he approached the unconscious by classical means but he also extended our understanding of pre-verbal factors in therapy through the study of regression which means the role of the current environment and transference environment side by side with insight giving. A true analyst he always put the patient's contribution first; once he said: "If I hear myself say 'moreover' I know I have got didactic"—his worst criticism in dealings with people. He insisted on that difference between what we might call "good psychiatry and God psychiatry"—which is central for the psycho-analytic method.

When it came to dealing with the world outside psycho-analysis, the two establishments he faced were those of Medicine and The Culture-of-the-Liberal-education. Here it was an advantage that he started psycho-analysis as a Fellow of The Royal College of Physicians; that he was a paediatrician appointed to a teaching hospital, and then that he had been to the Leys School in Cambridge, and had a father who was Mayor of Plymouth. On both scores he was on level terms when he switched professions. Nevertheless the new values were a contrast to the old ones. In his lifetime he completed the analysis of some 70 people. This, although he gave half his time always to long analyses and worked harder than most. His clientèle was privileged in all senses; not at all like a busy hospital out-patients. To work in this way was just as unpopular then, as it is now, and judged by the standard of tonsil operations and the quick cures in medicine his formal turnover and success were infinitesimal.

Worse than that, his sympathies and individual qualities increased his impact as an heretic. He was born into a Wesleyan household and remained a Protestant by temperament if not by allegiance. I use the word in the Quaker sense of testifying even, or especially, when to testify would seem to make no immediate difference. All his life because of his conviction, sincerity and integrity he was liable to have the effect of a gadfly who set the sacred cows bucking when they most were safely and contentedly grazing their new-won pastures; I fear this sometimes dried up their professional milk for a while. Examples are his campaign against leucotomy and E.C.T. These arose from a mistrust of therapeutic opportunism and treating symptoms, to which maladies the political role of the N.H.S. had seemed prone, in the practical expressions of its Mental Health Policy. Equally it was inconvenient to suggest that paediatricians should be analysed; to do so, by implication, undermined the status of medical trainings. From these examples it is clear he testified and by so doing he earned the opposition of various official establishments; nevertheless at the same time he remained en rapport with their officers. He may have been their despair but he was universally loved.

In the development of psycho-analysis in England he exercised a fertilizing liberal influence. By refusing to lead a group of like-minded independent psycho-analysts and help them to create an organization, he minimized a tendency to polarization into authority-ridden groups. Like Edward Glover, he paid a high price; Winnicott, at a time when he was the most fruitful and influential voice in the development of new ideas in child development and child analysis, was never allowed to give more than three lectures at the Institute in the courses of training in child analysis, in his whole career and during his 35 years as a psycho-analyst.

His preference for following Freud's own policy of not entering into controversy arose from his conviction, in the best Bloomsbury tradition of his time, of the need for detachment. A scientist can never be proved right, he puts forward hypotheses which can be proved wrong. Accordingly he wrote about his work from his heart and from his experience. His defence of true-self against false went so far as to assert that it is better to have a social breakdown, even if it takes more courage, than to continue to function with a false-self on a depersonalized compliance basis. I never heard him refer to Karl Popper's *Open Society & Its Enemies*, but he would surely have agreed to the dedication from Popper with which I introduced these remarks. His record of unwelcome testifications certainly made him seem a political innocent but it was part of his belief in the open society that he never criticized those who were not. He justified the idea of "doing your own thing" long before it was much spoken of and his statement that parents must even pay for their adolescents to oppose and attack them came from his own quality of being perpetually in touch with childhood; eager and a student till the last Sunday of his life.

This division of sympathies is epitomized in the fact that while he published two volumes of psycho-analytical collected papers, he issued three volumes of applied psycho-analysis. These last were about the child in the family and in the outside world. They made clear the meaning of child development for teachers, students, parents, probation officers, child care workers; all who work with the child in each of us, at every age. Both groups of papers had a wide influence but it is in the papers for the wider field that he most practically expresses two key concepts, and what can be done for their effects. The concepts are Deprivation: in which the baby loses security by tantalizing disappointment of its trained expectations—and Privation: in which there has been such a consistent absence of stimulation and support, that there is nothing to lose. Two *obiter dicta* convey these ideas and they show also his brilliant teaching gifts which appear in his use of wit, paradox and challenge. The two sayings, now internationally famous, are "there is no such thing as a baby" and "psychosis is a deficiency disease". This characteristic use of wit and the light touch were often misunderstood by the humourless, but even they after a moment's doubt cannot have supposed that he meant them as literally true; characteristically too he left it for the reader—as he did with patients—to work it out. They may mean all sorts of things to all sorts and conditions of men, but to me "no such thing as a baby" means that only a baby with a mothering person and her prejudices, convictions, family and local culture, can survive, or come to anything worthwhile. The value of parental devotion is his theme and he spoke straight to parents' convictions. The other idea that psychosis is a deficiency disease hit straight at received opinion of the time. Winnicott, of course, was not saying that organic or genetically determined psychoses never occur. His observation of privation and his reconstructions in analyses had taught him that the vast number of babies and adults who show psychotic defence mechanisms, or who have them so highly developed as to be deemed "psychotics" had been, in fact, potentially normal adults at birth. A characteristically disturbing but creative idea.

He proved for himself that Deprivation and Privation are hellish both for the patient, and for the analyst to treat in later life; he knew they cause untold misery and that at the time of the insult they can often be successfully undone. It was these two areas of failure in the good-enough holding environment which led him to areas of work which have made him one of the most valued and most widely loved figures in the field.

His work in open forum with mothers and fathers at Paddington Green, his lectures to child care workers and psychiatric social workers, his seminars for child guidance workers, paediatricians and probation officers, may all have arisen from applying his knowledge, as he put it in a sub-title: "through paediatrics to psycho-analysis", to hostel work. For it was when he was in hostel work during the war that he met and married his second wife, Clare Britton, and began, with her help, his second career of helping the rest of us to do preventive work. He always said that his BBC series at the end of the war *The Ordinary Devoted Mother and her Child* made for the wider acceptance of his ideas on deprivation, privation and prophylaxis. It was one of those lucky accidents that Janet Quigley and Isa Benzie of the BBC could help him to make these such a brilliant success.

The many collateral workers in psychological fields—the teachers, social workers, workers with maladjusted children—soon shared one thing with the mothers Winnicott influenced so dramatically on the BBC; he talked straight to their experience and made sense of it. He valued their knowledge and intuitions and saw his role as helping them to do their thing. This was the insight Socrates taught: that the slave in the dialogue, if he trusts his own judgment, knew innately what the trained mind comes to academically. Collateral workers not only found they could use the experts' knowledge of individual psychiatry and psycho-analysis but that they could do more in many areas than an expert in a clinic isolated from the actual field. He was instinctively, as an expert, suspicious of experts and "inexorable laws". He believed that expert knowledge is, in the last resort, only common sense.

If one tries to weigh up the losses as well as the gains one would have to say that Winnicott's informality and elevation of the common-sense ordinary man had led to an anti-intellectual disparagement of intellect and trained skill. But as yeast is to dough, and as egg white is to a meringue, so were his élan and eagerness to heavy theorizing. Many will remember his course given for the National Association for Mental Health. Here he demonstrated his therapeutic consultations for child psychiatrists and child therapists. He used what he casually called "squiggles" as an intermediary. These were a subtle medium of exchange with most important theoretical and teaching possibilities. Some professionals, less above the battle, would have called them by a heavier title. At these seminars he showed slides of the drawings made in child consultations and gave a commentary as relaxed and informal as his deliberately throw-away Squiggle title. Then in the interval he provided sherry all round with imaginative good manners so that, as correct analysts, we stood equidistant between the Ego, Super Ego and Id in viewing the material.

Winnicott with his gift of happiness also understood the Man of Sorrows; and personally in many ways a latter-day saint, he gave of himself unsparingly. The rest of us live more fully because of what he gave, and can give that much better ourselves, because of it.

MARTIN JAMES

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A BEHAVIOURAL SCREENING QUESTIONNAIRE FOR USE WITH THREE-YEAR-OLD CHILDREN. PRELIMINARY FINDINGS

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INTRODUCTION

Behaviour difficulties in preschool children form a significant part of the work load of paediatricians and psychiatrists. In spite of their clinical frequency there is doubt as to their nature—how they are caused, their prognosis, and their prevalence in the population as a whole. It would not be appropriate or indeed possible for all children with behaviour difficulties to receive psychiatric care (Eisenberg, 1961), and a better understanding of these conditions would clarify the role of psychiatric services. We need to know the numbers of children with behaviour problems and the special facilities they might require, e.g. in nurseries or play groups, which problems are likely to clear up spontaneously, and what measures are effective in dealing with those that persist.

There are no absolute criteria which can be used to distinguish problematic from non-problematic behaviour. Definition depends on the particular social and cultural milieu and on current expectations for each particular age group. A number of different approaches have been used. One is to study behaviours which lead to attendance at psychiatric clinics. We know that the number of children attending clinics represents only a small proportion of the children with behaviour problems (Shepherd *et al.*, 1966a; Ryle *et al.*, 1965; *Min. of Educ.*, 1955) but there is no reason to suppose that the sorts of problems seen in clinics are unrepresentative. Naturally there are important differences in the family or the child which lead to actual referral and these in themselves require investigation (Wolff, 1961).

Prevalence studies have focussed on individual "symptoms" or behaviours in the preschool child rather than on overall assessments of functioning. The most extensive investigation of this type was carried out by MacFarlane *et al.* (1954) who examined the prevalence of a number of behaviours in a group of children aged 21 months–14 yr. Other studies have investigated the prevalence of enuresis (Douglas and Blomfield, 1958; Newsom, 1968), fears (Jersild, 1935), anger (Goodenough, 1931) and habits (Traisman, 1958) in young children. These "problem" behaviours are common and are of varying significance when looking at the child's behaviour as a whole; it would obviously be useful to know the characteristics of those children in whom behaviour problems are associated with significant impairment of functioning.

Accepted manuscript received 6 *March* 1971

Clinical assessments in preschool children have relied largely on the unstructured clinical interview as a means of obtaining information, rather than on standardized rating scales or interviews. An unstructured interview may allow freer communication, since no constraining form is imposed by the interviewer. On the other hand, this procedure has the disadvantage of not providing information in a systematic manner, so that it is difficult to compare one child with another or to use the data for research purposes. The use of standardized methods in older children, besides providing information on the prevalence of behaviour problems (Rutter and Graham, 1966; Shepherd *et al.*, 1966b; Ryle *et al.*, 1965; Brandon, 1960; *Min. of Educ.* 1955), has also thrown light on some of the methodological problems involved in interviewing parents, teachers or children (Rutter and Graham, 1968; Graham and Rutter, 1968). One problem that has been revealed is the way in which the same behaviour may be reported differently by different observers; there is a need to examine this in relation to reports about younger children, especially as we are so reliant on parental histories for assessment in this age group, and in view of the widely held idea that the behaviour of young children is usually very variable.

As a preliminary to an investigation of behaviour difficulties in preschool children we developed a behavioural questionnaire which provides an inventory of behaviour shown by three-yr-old children. We examined the reliability of the questionnaire and its ability to identify children who were attending a psychiatric clinic.

METHOD

Development of behaviour questionnaire

The questionnaire was designed to be given in a short interview with parents, to obtain information on various aspects of development, health and behaviour, and to identify children with behaviour difficulties, marked developmental delay or physical handicap.

In preliminary trials with the questionnaire, parents of approximately 40 three-yr-old children were seen. The children were attending child welfare centres, a play group, a nursery school, a cerebral palsy clinic and a psychiatric clinic. The wording and form of the questions were modified in the light of experience and some were discarded. For instance, asking if a child was "in a world of his own", "withdrawn" or "not in contact" did not prove illuminating. Parents of autistic children did not recognize this as referring to their children, and others identified the behaviour as daydreaming. We attempted to define the behaviour in concrete terms so that parent and interviewer could both be talking about the same thing as far as possible. Naturally the judgment of whether a child is "difficult to manage" or "sad" depends on the parent's very personal feelings and perceptions, but these more "subjective" items were not necessarily less reliable than more objective behaviour.

A final form was evolved consisting of about 60 questions dealing with the current health, development and behaviour of the child (Appendix 1).

The developmental questions cover functions which have usually been attained in 3-yr-olds, such as ability to walk and run, to use a cup, spoon and fork, and to speak recognizable 3-word phrases (Neligan, 1969). The behaviour questions deal with behaviours which are known to cause concern and may lead to referral for psychiatric help.

As we wish to obtain information on the child's current status most of the questions refer to the 4 weeks previous to the interview apart from certain aspects of health—visits to general practitioners, the occurrence of asthma or eczema, vomiting —in which the whole previous year is a more meaningful time period, or the whole life span in the case of hospital attendances or seizures.

The questionnaire can be completed in about 20–30 min; when there are behaviour problems the interview usually lasts longer and in most cases the length of the interview is probably a good indicator of the difficulties the parent is experiencing.

Scoring

The questions must be asked precisely as worded, but can be supplemented until the interviewer feels confident about the rating. Ratings are made on all the statements about the child, wherever they occur in the interview and not only on the immediate answers to questions. A 3-point rating scale is used as being most effective in providing a sharp cut-off point, and more suitable for a screening procedure which is designed to pick out aspects of behaviour or development which are markedly problematic, rather than fine shades of variation. Thus, a score of 0 indicates that the behaviour question is absent, a score of 1 indicates that it is sometimes present or present to a mild degree, and a score of 2 that it occurs frequently or to a marked degree.

Behaviour scale

Twelve items of behaviour were selected to form a behaviour scale. They were chosen because they are amongst the most common reasons for attendance at psychiatric clinics in this age group, and examination of the protocols from the preliminary trials had shown that they discriminated most effectively between children attending the clinic and the other 3-yr-olds.

Although the distinction is somewhat arbitrary it was decided to exclude from the scale items in which biological maturity plays a major part in functioning, since inclusion would interfere with a subsequent investigation of the relationship between developmental status and behaviour. Thus enuresis and speech were not included in the scale but encopresis was included since by the age of 3 yr bowel control has usually been established except for occasional accidents.

As each item can be scored 0, 1 or 2 points (except hyperactivity which is rated 0 or 2), the scale has a maximum score of 24 points. From inspection of the preliminary protocols (those completed before the present investigation was started), a behaviour score of 11 or more points was chosen as the cut-off point for behaviour whether a child fell into the disturbed category, as this was the score which best distinguished the children attending the psychiatric clinic (Fig. 1).

Reliability study

The questionnaire was administered by two interviewers (N.R. and H.W.) to parents of children aged approximately 3 yr, with a range of ± 6 months. The children came from two child welfare centres, a nursery school, attenders at the

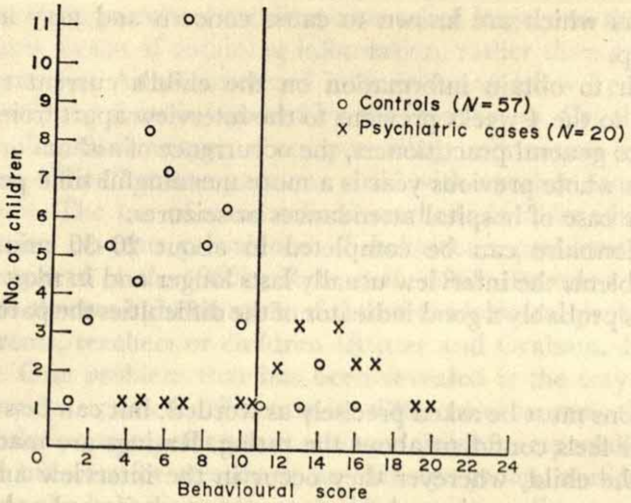

FIG. 1. Distribution of scores on behavioural scale.

Cerebral Palsy Unit and the Department of Psychological Medicine, Hospital for Sick Children, plus a few found through personal contact. The group obtained through the Department of Psychological Medicine included current attenders at the Day Centre, in-patients and out-patients, and in addition there were a number who were suspected of being retarded or of having speech problems, who had been seen for assessment and psychological testing only (Table 1).

TABLE 1. SOURCE OF CHILDREN IN RELIABILITY STUDY

	Interviews			Taped interviews			Total
	Male	Female	Total	Male	Female	Total	
Child welfare centre	9	7	16	0	0	0	16
Nursery school	6	7	13	2	2	4	17
Department of psychological medicine:							
psychiatric	8	7	15	1	3	4	19
retarded	1	2	3	3	4	7	10
Cerebral palsy unit	2	3	5	3	2	5	10
Other	1	4	5	0	0	0	5
	27	30	57	9	11	20	77

This sample is obviously a highly selected one, but the non-hospital group does provide a cross section of children from different social classes. The higher social classes I and II were less well represented in the hospital attenders (17·5 per cent) than in the group from non-attenders (29·0 per cent), but the two groups did not differ significantly in this respect ($\chi^2 = 3{\cdot}72$ $df = 3$ N.S.) (Gen. Reg. Off. 1961).

In 57 cases interviews were carried out by both interviewers on the same child at approximately one week's interval; 20 interviews were rated by both interviewers using a tape recording made by one of them (Table 1). There were no refusals to be interviewed but out of three cases in which a second interview was inconvenient, two were included in the series of taped interviews.

Findings

Reliability of score on behavioural scale

A behaviour score was calculated for each child by adding the points given on the 12 selected behaviour items. The inter-rater reliability for the total behaviour score calculated on the basis of the correlation coefficient was 0·77. On the taped interviews inter-rater reliability calculated similarly was 0·94.

Neither examiner had a significant tendency to rate higher or lower than the other ($t = 0{\cdot}25$ N.S.) but there was a significant tendency for the second interviewer to produce a lower rating ($t = 2{\cdot}48; p < 0{\cdot}02$). This indicates that perhaps a change in perception of the child had occurred, or that the mother may have felt that she had been too critical in the first interview. This result was surprising in that many mothers reported on the second interview that they had noticed aspects of their child's behaviour that were new to them since thinking about the questions, and one would have expected higher scores in these cases.

Practically all the interviews were done within 8 days of each other and behaviour was rated as an average over a 4-week period, so that transient episodes would not carry undue weight. Although several mothers reported the development of awkward behaviour between the two interviews, this appeared to contribute very little to variability of the total score. In 4 cases, because of holidays or delay in appointments, the time lag between interviews was 4–5 weeks. The different scores in these cases were 9 and 5, 9 and 10, 8 and 4, and 2 and 4. In 45 instances a difference of 3 points or less occurred between the two scores, and in 8 instances a difference of 4 or 5 points. There was no score which differed by more than 5 points.

TABLE 2. INTER-RATER AGREEMENT ON BEHAVIOURAL SCORES—ASSIGNMENT TO PROBLEM CATEGORY. TWO INTERVIEWS

Interview H.W. No. of children	Interviewer N.R. No. of children: With behaviour difficulties (score $\geqslant$ 11)	Interviewer N.R. No. of children: Without behaviour difficulties (score $<$ 11)	Total No.
With behaviour difficulties (score $\geqslant$ 11)	14	1	15
Without behaviour difficulties (score $<$ 11)	2	40	42
Total	16	41	57

Agreement between the two interviewers in separate interviews was high on whether a child was assigned to the disturbed category or not (Table 2). In 54 out of 57 cases (95 per cent) there was agreement on the assigned category—in the cases of disagreement the scores were 10 and 11, 12 and 10, 9 and 12.

On the taped interviews agreement on assignment was 95 per cent; in the one disagreement over assignment the scores were 11 and 10 (Table 3). There was no tendency for one interviewer to rate higher than the other ($t = 0\cdot1$ N.S.).

TABLE 3. INTER-RATER AGREEMENT ON BEHAVIOURAL SCORES—ASSIGNMENT TO PROBLEM CATEGORY. TAPED INTERVIEWS

	Interviewer N.R. No. of children		
Interviewer H.W. No. of children	With behaviour difficulties (score $\geqslant 11$)	Without behaviour difficulties (score < 11)	Total No.
With behaviour difficulties (score $\geqslant 11$)	4	1	5
Without behaviour difficulties (score < 11)	0	15	15
Total	4	16	20

Reliability of individual items of behaviour scale

The reliabilities of the individual items of the behavioural scale are shown in Table 4 and, as was to be expected, they are lower than the overall score.

A 2-point disagreement was uncommon, but the rate of 1-point disagreement was high (Table 4). Disagreements occurred over whether a particular item of behaviour was present or not, as well as whether it should be rated as 1 or 2 (Table 5).

TABLE 4. BEHAVIOUR SCALE. INTER-RATER RELIABILITY. TWO INTERVIEWS

Variable	r	Points 1 and 2. Times assigned by either interviewer	Agreement N	Agreement %	1 point disagreement	2 point disagreement
Eating problem	0·52*	39	(20)	51	17	2
Sleeping problem	0·56*	33	(19)	58	12	2
Soiling	0·77*	19	(16)	84	3	0
Hyperactivity	0·18	17	(7)	41		10
Concentration	0·15	22	(8)	36	12	2
Relationships	0·31‡	46	(21)	46	24	1
Dependency	0·48†	41	(22)	54	19	0
Difficult to manage	0·48†	45	(24)	53	21	0
Tempers	0·43†	46	(28)	61	16	2
Disorder of mood	0·38	21	(13)	62	7	1
Worries	0·25	37	(14)	38	23	0
Fears	0·61*	41	(31)	76	10	0

*$p < 0\cdot001$.
†$p < 0\cdot01$.
‡$p < 0\cdot05$.

TABLE 5. BEHAVIOUR SCALE. INTER-RATER RELIABILITY: AGREEMENT ON EACH SCALE POINT. TWO INTERVIEWS

Variable	No. assigned 0 by either interviewer	Agreement		No. assigned 1 by either interviewer	Agreement		No. assigned 2 by either interviewer	Agreement	
		N	%		*N*	%		*N*	%
Eating problem	29	(18)	62	27	(10)	37	20	(10)	50
Sleeping problem	32	(23)	72	22	(10)	45	16	(9)	56
Soiling	41	(38)	92	4	(1)	25	15	(15)	100
Hyperactivity	49	(39)	79				17	(7)	41
Concentration	44	(34)	78	17	(5)	29	9	(3)	33
Relationships	30	(11)	37	33	(10)	30	18	(11)	61
Dependency	29	(15)	52	33	(14)	42	13	(8)	61
Difficult to manage	28	(11)	39	36	(15)	41	13	(9)	69
Tempers	22	(10)	45	40	(24)	60	12	(4)	33
Disorder of mood	40	(35)	87	16	(9)	56	8	(4)	50
Worries	37	(21)	57	32	(14)	44	5	(0)	0
Fears	21	(15)	68	32	(22)	69	12	(9)	75

Reliability is good for the presence of soiling, eating and sleeping problems and fears, and fairly high for dependency, difficulty in management, tempers and relationships with others. It is poor for concentration, hyperactivity and anxiety, and these items appear difficult to assess and rate. Although questions about concentration and hyperactivity were made as specific as possible, both parents and interviewers had difficulty in deciding on their characteristics. Concentration on different activities and at different times of the day may be so variable that the parent cannot form a consistent opinion about it, or remember how long a child usually spends on a given activity.

Most 3-yr-olds are extremely active and the mothers were asked specifically about ability to sit still for meals or to listen to a story so that "normal" high activity could be distinguished from hyperactivity. In fact it is often the aimlessness of activity rather than the actual amount which leads to the label of "hyperactive", and this is obviously not an easily demarcated entity (Werry, 1968).

The majority of parents interviewed had never thought about whether their child ever worried or was anxious, and found the question surprising. Despite the fact that the interviewers concentrated on eliciting actual behaviour observed by the mother, unfamiliarity with the concept of anxiety in childhood may have led to different information being produced in the two interviews, thus contributing to greater test-retest unreliability. It is not easy to decide whether a young child is anxious since he does not tell us so directly and we must use inferences about his state derived from introspection or from other adults. Thus, one of the children in our study, after seeing an accident, kept asking about death and accidents; we might infer that she was worried about the event but this was not the mother's interpretation. Similarly extreme reactions to change or loss of an important object were not considered as evidence of anxiety; parents appreciate the fact that their children do not want to be left alone, especially at night, but this is not seen in terms of "worry" about being alone.

Reliability of individual items of behaviour scale—taped interviews

Disagreement occurred much less often in the taped interviews and there was a satisfactory reliability for most items (Table 6). There were no 2-point disagreements and few 1-point disagreements, although as the numbers are small the reliabilities must be treated with caution (Table 7). There is obviously difficulty with rating concentration and worries, but how much this is a reflection of the vagueness of the mothers' replies, and how much to unclear rating procedures, is uncertain. The low agreement over the presence of fears in the taped interviews seemed to be associated with difficulty in deciding on the distinction between fear and dislike (for instance, over having the hair cut and washed), often a very difficult thing to do even in adults, and also in deciding how strong the fear was. There is also a problem in rating fears of imaginary animals, monsters or witches, etc. as to whether they should go into the category of anxiety. Fear was defined as apprehension about something present, e.g. of dogs, loud noises; and anxiety as apprehension about something which may happen, e.g. being left alone or attacked by a witch. However, since a young child is not always sure what is real and what is imaginary, the distinction between an anxiety and a fear may not always be meaningful at this age.

TABLE 6. BEHAVIOUR SCALE. INTER-RATER RELIABILITY. TAPED INTERVIEWS

Variable	r	Points 1 and 2. Times assigned by either interviewer	Agreement N	Agreement %	1 point disagreement
Eating problem	0·83*	14	(11)	79	3
Sleeping problem	0·85*	16	(15)	94	1
Soiling	0·84†	10	(9)	90	1
Hyperactivity		2	(2)	100	0
Concentration	0·20	7	(4)	57	3
Relationship	0·72†	15	(13)	87	2
Dependency	0·55	12	(9)	75	3
Difficult to manage	0·54†	16	(12)	75	4
Tempers		16	(16)	100	0
Disorder of mood	0·84‡	7	(6)	86	1
Worries	0·51	14	(9)	64	5
Fears	0·52‡	16	(10)	62	6

*$p < 0{\cdot}001$.
†$p < 0{\cdot}01$.
‡$p < 0{\cdot}05$.

Reliability of items not in behaviour scale

The reliability of these items varied a great deal, being poor for several cases where it would be thought there would be little room for variation, e.g. in the child's ability to use a spoon or fork, and in the frequency of enuresis (Tables 8 and 9).

Visits to the general practitioner were not as well remembered as visits to hospitals as in-patients or out-patients as might be expected, but within the limits of the categories used to group the number of visits, the reliability of these three items was good. Most other questions about health were reliable, but the numbers in these categories were small.

The ratings of diarrhoea and vomiting were affected by a gastrointestinal infection which happened to attack the children in the nursery school during the week after the first interview. Most of the other attacks of vomiting occurred in association with infections throughout the year and seemed to be poorly recalled.

Most parents remarked that when their child complained of pain (complaints following immediately after a fall or knock were excluded), it was to gain attention or in imitation of someone else in the family. They were uncertain whether the child really felt pain and therefore whether to mention it, although they were asked to describe all complaints of pain regardless of what they thought was the cause.

There was a surprising amount of disagreement about daytime enuresis, which may be due to indecision on the mother's part as to whether to include the dampness or occasional wetting that occurred when the child was excited or too involved to go to the toilet. The ratings of nocturnal enuresis were affected by the fact that several children who had been dry for some time were enuretic between the two interviews. It is possible that knowing another interview was going to take place made the mother more alert to behaviour she had been asked about. This factor may have influenced other behaviour, for instance—several children were given a fork to use or encouraged to use a spoon more in the interval between the two interviews.

Table 7. Behaviour scale. Inter-rater reliability: agreement on each scale point. Taped interviews

Variable	No. assigned 0 by either interviewer	Agreement		No. assigned 1 by either interviewer	Agreement		No. assigned 2 by either interviewer	Agreement	
		N	%		*N*	%		*N*	%
Eating problem	6	(6)	100	9	(6)	67	8	(5)	63
Sleeping problem	5	(4)	80	15	(14)	93	2	(2)	100
Soiling	10	(10)	100	3	(2)	68	8	(7)	88
Hyperactivity	18	(18)	100				2	(2)	100
Concentration	13	(13)	100	6	(3)	50	4	(1)	25
Relationships	5	(5)	100	12	(10)	83	5	(3)	60
Dependency	10	(8)	80	11	(8)	71	2	(1)	50
Difficult to manage	6	(4)	67	14	(10)	71	4	(2)	50
Tempers	4	(4)	100	9	(9)	100	7	(7)	100
Disorder of mood	14	(13)	93	5	(4)	80	2	(2)	100
Fears	6	(4)	67	11	(5)	45	9	(5)	55
Worries	10	(6)	60	14	(9)	64	1	(0)	0

TABLE 8. INTER-RATER RELIABILITY ON ITEMS NOT IN BEHAVIOUR SCALE. TWO INTERVIEWS

Variable	*r*	Points 1 and 2. Times assigned by either interviewer	Agreement		1 point disagreement	2 point disagreement
			N	%		
G.P. visits	0·87*	46	(39)	85	7	0
In-patient	0·85*	22	(20)	91	2	0
Out-patient	0·94*	42	(39)	93	3	0
Diurnal enuresis	0·33	26	(16)	61	9	1
Nocturnal enuresis	0·72*	36	(28)	78	8	0
Habits	0·32‡	55	(33)	60	21	1
Vomiting	0·25	40	(27)	67	12	1
Pains	0·33	34	(20)	59	13	1
Pica	0·20	14	(8)	57	3	3
Uses bottle	0·51‡	20	(16)	80	3	1
Use of cup	0·57	11	(8)	73	3	0
Use of spoon	0·45	9	(4)	45	5	0
Use of fork	0·52	12	(5)	42	7	0
Speech		8	(8)	100	0	0
Articulation	0·38‡	35	(25)	71	10	0
Stammer	0·20	7	(1)	14	6	0
Asthma/wheezing	0·73‡	9	(7)	78	2	0
Skin complaint	0·72‡	9	(8)	89	1	0
Fits		2	(1)	50	1	0
Constipation	0·59*	13	(8)	62	5	0
Diarrhoea	0·25‡	10	(2)	20	8	0
Hearing		1	(1)	100		
Vision		3	(1)	33	2	0
Squint		6	(3)	50	1	2
Clumsiness/handicap	0·45‡	20	(13)	65	7	0

*$p < 0{\cdot}001$.
†$p < 0{\cdot}01$.
‡$p < 0{\cdot}05$.

Articulation in 3-yr-olds commonly shows minor anomalies which are accepted as a matter of course by most parents. Obviously standards differ about what is appropriate speech for a 3-yr-old, and it was heard to be unclear during a few interviews when the mother reported no impairment. It appears that speech anomalies and stammering may be reported inconsistently but that the ability of the child to speak in phrases or use single words is more reliably described. The reports on habits varied considerably; since they are common it may be that their existence causes no concern and is not easily brought to mind.

The taped interviews indicate that some, but not much, of this variation was due to difficulty in rating, i.e. in deciding whether a habit should be considered frequent or not. The frequency of vomiting and of complaints of pain also presented some difficulty in rating, otherwise the reliability of these items not in the behavioural scale was consistently high (Tables 10 and 11).

TABLE 9. INTER-RATER AGREEMENT ON ITEMS NOT IN BEHAVIOUR SCALE. TWO INTERVIEWS

Variable	Assigned 0 by either interviewer	Agreement *N*	Agreement %	Assigned 1 by either interviewer	Agreement *N*	Agreement %	Assigned 2 by either interviewer	Agreement *N*	Agreement %
G.P. Visits	12	(11)	92	32	(25)	79	20	(14)	70
In-patient	36	(35)	97	21	(19)	90	2	(1)	50
Out-patient	18	(15)	83	22	(19)	86	20	(20)	100
Diurnal enuresis	36	(31)	86	13	(3)	23	19	(13)	68
Nocturnal enuresis	25	(21)	84	13	(5)	38	27	(23)	85
Habits	23	(12)	52	40	(19)	47	24	(14)	56
Vomiting	27	(17)	63	37	(25)	67	6	(2)	33
Pains	32	(23)	72	28	(15)	53	10	(5)	50
Pica	47	(43)	91	8	(5)	62	8	(3)	38
Uses bottle	39	(37)	95	3	(0)	0	18	(16)	89
Use of cup	47	(46)	98	9	(6)	68	4	(2)	50
Use of spoon	57	(48)	94	7	(2)	29	4	(2)	50
Use of fork	49	(45)	92	8	(1)	13	6	(4)	68
Speech	49	(49)	100	7	(7)	100	1	(1)	100
Articulation	21	(14)	68	33	(23)	70	5	(2)	40
Stammer	48	(43)	90	7	(1)	15	1	(0)	0
Asthma/wheezing	50	(48)	96	6	(4)	68	3	(3)	100
Skin complaint	49	(48)	98	8	(7)	87	1	(1)	100
Fits	56	(55)	98	2	(1)	50	0	(0)	
Constipation	47	(44)	94	8	(3)	37	7	(5)	71
Diarrhoea	54	(47)	87	9	(1)	11	2	(1)	50
Hearing	56	(56)	100	1	(1)	100	0	(0)	
Vision	55	(54)	98	2	(0)	0	2	(1)	50
Squint	54	(51)	95	1	(0)	0	5	(3)	60
Clumsiness/handicap	44	(37)	84	14	(7)	50	6	(6)	100

TABLE 10. INTER-RATER AGREEMENT ON ITEMS NOT IN BEHAVIOUR SCALE. TAPED INTERVIEWS

Variable	Assigned 0 by either interviewer	Agreement *N*	Agreement %	Assigned 1 by either interviewer	Agreement *N*	Agreement %	Assigned 2 by either interviewer	Agreement *N*	Agreement %
G.P. visits	4	(3)	75	11	(10)	90	6	(6)	100
In-patient	7	(7)	100	13	(13)	100	0	(0)	100
Out-patient	5	(5)	100	4	(4)	100	11	(11)	100
Diurnal enuresis	9	(9)	100	5	(4)	80	7	(6)	86
Nocturnal enuresis	5	(5)	100	5	(4)	80	11	(10)	91
Habits	2	(0)	0	17	(11)	65	7	(3)	43
Vomiting	11	(10)	91	9	(6)	67	3	(1)	33
Pains	10	(10)	100	9	(6)	67	4	(1)	25
Pica	12	(12)	100	5	(5)	100	3	(3)	100
Uses bottle	14	(14)	100	0	(0)	100	6	(6)	100
Use of cup	14	(14)	100	6	(5)	83	1	(0)	0
Use of spoon	14	(14)	100	5	(5)	100	1	(1)	100
Use of fork	12	(12)	100	4	(4)	100	4	(4)	100
Speech	16	(16)	100	4	(4)	100	0	(0)	0
Articulation	5	(5)	100	9	(9)	100	2	(2)	100
Stammer	15	(15)	100	1	(0)	0	1	(0)	0
Asthma/wheezing	17	(17)	100	2	(2)	100	1	(1)	100
Skin complaint	18	(18)	100	1	(1)	100	1	(1)	100
Fits	18	(18)	100	2	(2)	100	0	(0)	100
Constipation	15	(15)	100	1	(1)	100	4	(4)	100
Diarrhoea	19	(19)	100	1	(1)	100	0	(0)	100
Hearing	20	(20)	100	0	(0)	100	0	(0)	100
Vision	18	(18)	100	1	(1)	100	1	(1)	100
Squint	18	(18)	100	0	(0)	100	2	(2)	100
Clumsiness/handicap	10	(10)	100	5	(4)	80	6	(5)	83

TABLE 11. INTER-RATER RELIABILITY ON ITEMS NOT IN BEHAVIOUR SCALE. TAPED INTERVIEWS

Variable	r	Assigned 1 or 2	Agreement N	Agreement %
G.P. visits	0·86*	17	(16)	94
Diurnal enuresis	0·72†	11	(10)	91
Nocturnal enuresis	0·83*	15	(14)	93
Habits	0·55†	20	(14)	70
Vomiting	0·45	10	(7)	70
Pains	0·41	10	(7)	70
Clumsiness/handicap	0·84‡	10	(9)	90

*$p < 0·001$.
†$p < 0·05$.
‡$p < 0·01$.

Validity of the behaviour scale

A screening procedure is required to be both sensitive and specific, i.e. able to identify a high proportion of cases without producing a large number of false positives. Since the cut-off point in any screening procedures is arbitrary, there is bound to be some overlap in score between cases and non cases.

Out of 20 clinic attenders who were rated (19 in reliability study, and one not in the study), 15 had scores of 11 or more which identified them as having behaviour difficulties, as rated by one of the interviewers (N.R.). Three not identified by either examiner all had severe speech problems, and would have been assigned as having developmental delay. In one case the mother was reluctant to talk about her child and did not describe behaviour which had been observed by the clinic staff. The other two children had marked autistic features. They were from the West Indies and communication with their mother was very difficult. A fourth child had mild alopecia and severe rocking in bed at night which disturbed the whole family and the neighbours. The method of scoring the behaviour scale obviously precludes identifying children with only one or two problems, however disturbing these may be. The fifth child received a score of 10 from one interviewer (N.R.) and 12 from the other (H.W.).

The behaviour scale used in conjunction with the presence of severe speech difficulties thus picked out 90 per cent of children attending a psychiatric clinic. Seventy-five per cent were selected by the behavioural scale alone. It was not possible to complete the interviews without knowing whether the children were attending the psychiatric clinic, and this could have influenced the ratings. Ideally the interviews should have been conducted and rated in ignorance of this information, but in practice this is difficult to achieve, especially as parents are likely to inform the interviewer if their child is attending a clinic, even if not asked specifically.

Specificity of the scale

Five of the children contacted through the Child Welfare Clinics (3 boys and 2 girls) received scores of more than 10, as rated by one interviewer (N.R.). One of the boys (rated 10 by the other interviewer) also had a serious speech difficulty.

Although the sample is not representative of any population, it is useful to consider the frequency of difficulties in the group excluding all the hospital attenders as an indication of the specificity of the scale as a screening device. 16·5 per cent of the boys and 10 per cent of the girls (13·1 per cent of the total group) fell into the behaviour difficulty category. We have no other data with which to compare these findings, but although somewhat high, they are within the range suggested by some other investigations, in older children, as to the number likely to have handicapping behaviour difficulties (Min. of Educ. 1955; Ryle, 1965). It is worth noting that in all these cases the mothers said that they found their children very difficult to manage, even though in two cases there had been considerable improvement over the past 6 months. From the information obtained during the administration of the questionnaire it was apparent that at least 4 of these children had marked behaviour problems but this was accepted philosophically as part of the child's nature and there had been no thought of seeking help. This finding is in agreement with others that only a small proportion of children with behaviour difficulties find their way to clinics (Shepherd *et al.*, 1966; Ryle *et al.*, 1965).

It would be necessary to know how many false negatives occurred in this group of children, i.e. how many children with behaviour problems were not identified, in order to examine the sensitivity of the screening instrument fully. To do this more intensive interviews would have been necessary plus an examination of the child, or a knowledge of the base rate of children with behaviour difficulties in the population.

Validity of individual items of behaviour scale

As rated by one of the interviewers (N.R.) 9 of the items from the behaviour scale discriminated between children attending the psychiatric clinic and the control

TABLE 12. SIGNIFICANCE OF THE ASSOCIATION (χ^2) BETWEEN INDIVIDUAL ITEMS OF THE BEHAVIOUR SCALE AND ATTENDANCE AT A PSYCHIATRIC CLINIC

	p
Soiling Mood Dependency	< 0.001
Difficult to control Concentration	< 0.01
Sleeping problems Eating problems Anxiety Marked problems with mixing	< 0.05
Tantrums Fears Hyperactivity	N.S.

group (excluding the retarded and physically handicapped) (Table 12). These were soiling, mood, dependency ($p < 0{\cdot}001$), difficult to control, poor concentration ($p < 0{\cdot}01$), sleeping and eating problems, anxiety and marked problem with mixing ($p < 0{\cdot}05$). Tantrums, fears and hyperactivity did not discriminate, but excluding these items did not improve the overall discriminating power of the scale.

Certain items, persistent soiling, marked unhappiness or irritability, and inability to concentrate for more than a few minutes, are particularly discriminating in that only children rated as having a behaviour problem received a score of 2 for these items.

It is of interest to note that the presence of diurnal enuresis (not nocturnal enuresis) and habits were significantly more common in the children with behaviour problems ($p < 0{\cdot}05$).

OTHER ITEMS OF THE QUESTIONNAIRE

Certain other items not in the behaviour scale were included so that their reliability could be examined. It is intended to use this part of the questionnaire subsequently with a larger sample to identify children with marked delay in development or serious physical handicap. It will then be possible to investigate the relationship between behaviour problems and these variables, together with social and family factors.

As the present sample is small and highly selected it could not be used to examine the validity of the questions on development or the relationship between behaviour problems and developmental delay. In fact several of the children considered to have behaviour problems did also show signs of developmental delay, and in this small sample there is obviously an overlap between the two conditions. Problems of speech were particularly striking in this respect. Speech that was very difficult to understand and inability to speak 3-word phrases occurred only in children considered to have behaviour problems, cerebral palsy or retardation. The 2 control children who had speech that was very difficult to understand were amongst the group of 5 who received 11 or more points on the behaviour scale; of the 20 attending as psychiatric patients 6 were not speaking in 3-word phrases and 2 had very poor articulation. The relationship between speech and behaviour requires more intensive investigation with a larger sample.

DISCUSSION

It is inevitable that in the preschool child we are mainly dependent on the parent's history in assessing a child's functioning, since it is often difficult to observe the child directly (e.g. at bedtime) or to obtain information from the child, or from other observers outside the family. The history will be affected by parental expectations and attitudes as well as by what the child actually does, even though an attempt is made to obtain descriptions of concrete behaviour rather than opinions.

Our analysis indicates some of the areas where communication and mutual understanding can be improved. For instance, it seems particularly difficult for parents and interviewers to decide whether a child is anxious or not, and it would obviously be useful to explore the meaning of this concept in young children and how it could be defined more precisely. More detailed histories and direct observation of children would throw light on the relationship between actual behaviour and parental perceptions and reports.

Problems will also arise in assessment when disagreement between description of behaviour and observation is due to actual change in the child over a short period, as well as to different ways of perceiving the child. In general, children are more labile than adults and although fairly stable underlying patterns of reaction may exist (Thomas *et al.*, 1963; Kagan and Moss, 1965), quite wide fluctuations in behaviour even from day to day accompany normal development. This makes it difficult to form or describe a consistent picture of behaviour, and reliability is thus affected by variation in the child as well as by variation in the informant and the recorder.

In this study an average of behaviour over a 4-week period was chosen to limit the effects of transient variations in the child, but even in 1 week, it is possible for significant changes to occur, as we found in several children. We were told that there had been a sudden development or cessation of sleeping or eating difficulties, temper tantrums or being difficult to manage, and this altered the rating of individual items, although having less effect on total behavioural ratings.

The variability of response obviously affects what conclusions can be drawn from history or observation at one point in time, and further work is required to investigate the difference between transient behaviour difficulties, those that persist and recurrent brief periods of difficulty. It would be useful to know more about the amount of variation which occurs in "normal" children and the frequency of short-lived episodes of difficulty.

Our findings are in agreement with other investigations of reliability in interviews in that the reporting of individual items of behaviour tended to have a low reliability, although overall assessment was much more reliable (Rutter and Graham, 1968; Graham and Rutter, 1968). For a small number of items difficulty was due to problems in deciding the correct scale point by the interviewers; unreliability on the other items can be accounted for by variation in the child's behaviour and the mother's responses although the contribution of each of these factors cannot be distinguished without more detailed investigation of the child and the family

It is reasonable to question the validity of examining behaviour difficulties in young children in isolation rather than looking at the parent–child relationship. The young child cannot be considered as having an entirely independent existence and all difficulties must be seen in the context of the total family situation. The dependency of the child and the close "symbiotic" relationship it has with the mother or father makes it difficult to distinguish the roles played by each or to see them as separate individuals. However, it does appear possible to identify individual characteristics in the child which contribute to the development and behaviour difficulties, for instance, neurological or temperamental factors (Pasamanick *et al.*, 1956; Prechtl 1961; Thomas *et al.*, 1968), and our limited findings confirm this.

Future plans to carry out a survey on a larger population of 3-yr-old children should demonstrate in what way behaviour problems are related to developmental and neurological status, as well as to other variables such as health, family and social environment. With larger numbers it would be possible to derive weights for the

[illegible] Research
[illegible]
6.3.81

individual items of the behaviour scale according to their discriminating ability and thus increase the power of the scale.

In general, however, the reliability and validity of the behavioural scale indicate that it will be a useful tool for investigating the behavioural characteristics of preschool children. The questionnaire could be used for finding out the prevalence of behaviour difficulties and developmental delay in a given population and for comparing different groups of children with each other. It enables data to be collected systematically about individual children and might therefore be of value in clinical work.

SUMMARY

The development of a *questionnaire* to be completed by parents for use in screening *preschool children* is described.

Ninety per cent of children attending a psychiatric clinic were identified when the criteria were a score of 11 or more points on the behaviour scale and/or inability to speak in 3-word phrases, and/or speech which was very difficult to understand.

The questionnaire could be used as a basis for collecting information systematically about preschool children, and as a screening device for identifying children with *behaviour difficulties* and *developmental delay.*

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APPENDIX

*Health and behaviour questionnaire**

This questionnaire is devised to obtain a picture of the development and behaviour of 3-yr-old children. It contains questions on health and development and the kinds of behaviour that normal children often show. In order to make sure that the results from all the questionnaires are comparable, it is important to ask all the questions exactly as worded. Additional questions may be required to make the answer clear and are enclosed in brackets ( ); occasionally it may be necessary to ask further questions about a particular point.

Filling in the form

Wherever possible briefly record the information on which the ratings are based, additional comments in the margins are very helpful. When making a rating take into consideration all relevant information obtained during the interview, not only the immediate answer given to a question. Code 9 if not known but if in doubt about the correct rating write down the answer and the rating can be decided later after discussion. The form should be filled in at the time of interview to avoid inaccuracies or slips of memory.

Apart from a few exceptions (e.g. *illness history covers the whole life period, vomiting covers the past 12 months*), *all questions refer to the* 4 *weeks preceding the time of interview; the ratings should be an* average *of behaviour occurring in this time period. Divide the number of events by four to obtain the average over a 4-week period.*

INTRODUCTION

My name is .... We wrote to say I would be calling. We're trying to find out how 3-yr-olds develop and behave and we're asking parents to help us with their experience. I'd like to ask you a few questions about how your child is getting on. Most of the questions are about the past 4 weeks only because that's the period we're mainly interested in.

Number ☐☐☐☐☐ 5–10

---

*Notes on coding and on scoring behaviour scale available on request.

Name of child ....

Date of Birth..

Address ....

....

Telephone Number ....

Male 0 Female 1 Sex ☐ 11

Has *X* been seen by your family doctor (general practitioner) in the past 12 months? What for?
Anything else? How many times altogether? General practitioner ☐ 12
Reasons for visits

No. of visits	None	0
	1–5	1
	6+	2
	Don't know	9

Has *X* ever been an in-patient in hospital even for a night for an illness or accident? What for? When was this? Anything else? (Exclude birth unless kept in hospital for some neonatal condition. Code as for visits to G.P.) In-patient ☐ 13

Reasons and ages at admission:

What about out-patients? (Exclude child Welfare Centres. Code as for visits to G.P.) Out-patient ☐ 14

Reasons and ages at attendance:

Has *X* had any wheezing attacks or asthma in the *past 12 months*? ☐ 15

No	0
Wheezing attacks	1
Asthma	2
No known	9

(If asthma and wheezing attacks Code 2)
Describe:

Has *X* had any eczema or any other skin condition in the *past 12 months*? ☐ 16

No	0
Other skin condition	1
Eczema	2
Not known	9

(If eczema and other condition Code 2)
Describe:

Has *X* *ever* had a fit or convulsion?
When was this? When was the last time? ☐ 17

Age(s) when had fit(s)

No fits	0
Possibly had fits	1
Has had fits	2
Not known	9

Have there been any eating problems in the past *4 weeks* like a very poor appetite?
Does *X* eat everything or is he/she fussy?

Poor appetite ☐ 18

How often do you feel *X* isn't eating enough . . . or isn't getting the right food?

Faddy eater ☐ 19

No eating problems (include here the occasional missed meal or fad)	0
Some eating difficulties (has a few fads, or has a poor appetite for one meal a day or less)	1
Marked difficulties (appetite poor for at least half the meals: diet mainly milk and/or baby foods or sweets and biscuits, or eats only a few articles of food or refused practically all meat and/or vegetables)	2
Don't know	9

Some children eat or drink unusual things which aren't food. Does *X* ever do this? Things like paper, coal, toys, dirt. How often in the past 4 weeks?

Things eaten:

☐ 20

(Do not include things that are sucked like buttons; objects must be definitely chewed, eaten or drunk)

Never eats or drinks things not food	0
Sometimes eats things not food—twice a week or less	1
Frequently eats things not food—three times a week or more	2
Not known	9

Does *X* drink from a bottle during the day or before going to sleep (Include *Heinz* or *Dinky* beakers as cup)

Never drinks from bottle	0
Drinks from bottle but also uses cup	1
Uses bottle exclusively	2
Not known	9

☐ 21

Can X drink from a cup without help? Is it a full cup or must it be less than this?

Cup half full or more	0
Has to be helped or less than half full, or uses *Heinz* or *Dinky* beaker	1
Unable to use cup	2
Given no opportunity to use	3
Not known	9

☐ 22

Can *X* use a spoon . . . and a fork? Are there any difficulties in using the spoon . . . or the fork?

Spoon ☐ 23

Used with reasonable skill	0
Difficulty in using	1
Unable to use	2
Given no opportunity to use	3
No known	9

Fork ☐ 24

Does *X* ever have attacks of vomiting?
How often in the past 12 months? (1 attack: any vomiting occurring over a 24-hour period)

Never vomits	0
Less than 1 attack per month	1
1 attack per month or more	2
Not known	9

☐ 25

In the past 4 weeks has *X* complained of any pains in the stomach . . . or the head . . . the arms or legs . . . anywhere else
How often is this?

(Include all complaints of pain even if child is thought to be pretending or asking for attention, but not if this is reported)

No complaint	0
Complains twice a week or less	1
Complains three times per week or more	2
No speech	3
Not known	9

Description of pains:

Stomach ache	☐	26
Headache	☐	27
Limb pains	☐	28
Other	☐	29

Has *X* had any bowel problems in the past 4 weeks like constipation (Rate on number of days has *difficulty in* opening bowels).

What about diarrhoea?
How often has *X* had an accident—soiled—in the past 4 weeks?

And has *X* been wet at night or during the day? How often?

None	0
Twice a week or less	1
Three times a week or more	2
Not known	9

Constipation	☐	30
Diarrhoea	☐	31
Soiling	☐	32
Wetting in the day	☐	33
Wetting at night	☐	34

What are the sleeping arrangements for *X*?
Does he/she share a room? Or a bed?

Sleeps alone/own room	1
Sleeps with parents/own bed	2
Sleeps with parents/parents' bed	3
Sleeps with sibs/own bed	4
Sleeps with sibs/shares bed	5
Shares bed with sibs in parents' room	6
Any other sleeping arrangement/own bed	7
Any other sleeping arrangement/shares bed	8
Not known	9

☐ 35

A lot of children don't like going to bed.
What about *X*?
What about going to sleep?
Does he sleep right through the night?
(What happens? How often does this happen?
How long does it last?)

Going to bed/going to sleep ☐ 36

Waking at night ☐ 37

No problem or problems less than once a week	0
Problem occurs 1–2 a week only	1
Problem occurs 3 times a week or more and either takes more than 1 hour to get to sleep, or wakes more than once at night or for more than a few minutes, or goes into parents' room or bed	2
Not known	9

How often do you take *X* into your bed,
or sleep in *X*'s bed because *X* is upset?

Never sleep with child	0
Occasionally: all night once a week or less, or for a couple of hours only, more often	1
Frequently: all or most of the night twice a week or more	2
Not known	9

☐ 38

Does *X* have any habits before going to sleep or during the day?

What about . . .? Any others?

Headbanging ☐ 39

Rocking ☐ 40

Nervous movements like blinking, pulling faces, grinding teeth ☐ 41

Picking, pulling, scratching hair, skin or nails ☐ 42

Scale A for individual habits

None	0
Sometimes: usually less than 20 mins a day	1
Frequently: usually more than 20 mins a day	2

Not known	9

Sucking thumb or fingers ☐ 43

Sucking other objects ☐ 44

Biting nails ☐ 45

Playing with self down below ☐ 46

☐ 47

☐ 48

☐ 49

Describe:

Scale B for overall rating of habits

No habits	0
1–3 habits sometimes or 1 frequent habit	1
2 or more frequent habits, or 4 or more habits altogether	2

☐ 50

What is *X* saying now? Does he/she put words together?

Example of speech:

Phrases of 3 or more words	0
Single words	1
No recognizable words	2
Not known	9

☐ 51

How clear is his/her speech?
Do people outside the family understand it?
Does he/she have difficulty saying any sounds or letters?

☐ 52

Clear speech	0
Slight difficulty	1
Very difficult to understand	2
No speech or single words	3
Not known	9

Describe difficulty:

Does he/she ever stutter or stammer?
How bad is it? Severe: present nearly all the time, interferes markedly with communication.

No stammer	0	☐ 53
Slight stammer	1	
Severe stammer	2	
No speech or single words	3	

Are there any problems over hearing or seeing?
Describe:

Hearing ☐ 54

Vision ☐ 55

No problems	0
Possible problem	1
Definite problem	2
Not known	9

Does *X* ever have a squint in the eyes? (lazy eye, cast, 2 eyes looking in different directions)

No squint	0	☐ 56
Possible squint	1	
Definite squint	2	
Not known	9	

Can *X* use both arms and hands properly . . . and both legs?
Can *X* run? Do you think *X* is clumsy for his/her age?
In what way?

Upper limbs ☐ 57

Lower limbs ☐ 58

No problem	0
Appears markedly clumsy for age	1
Definitely handicapped	2
Not known	9

Describe:
How active is *X*? Is he/she the sort of child who doesn't like sitting still even for meals? How many minutes will he/she sit at mealtimes usually?

☐ 59

Not markedly active	0
Very active	1
Hyperactive—sits still for meals or on other occasions usually less than 5 minutes	2
Not known	9

What kind of things does *X* like to play with indoors? Describe:

What's the longest time *X* will *usually* stick at one thing indoors if interested?

Concentrates *usually* for 15 mins or more	0
Concentrates *usually* for 5–14 mins or *very variable*	1
Concentrates *usually* never more than a few minutes	2
Not known	9

☐ 60

Has he got any brothers or sisters?
How old are they?

	Sex	Date of birth
1		
2		
3		
4		
5		

Number of children living in household ☐ 61

How have they got on together in the past 4 weeks? Do they squabble much? How much is playing together affected?
What about with other children?

	Sibs	Peers	
Starts arguments or quarrels			62
Gets teased, bullied, upset			63
Seems shy, inhibited			64
Ignores others			65
Seems jealous			66
Other			67
			68

Trivial or no difficulties	0
Some difficulties: play disrupted or prevented most times but only for short periods	1
Marked difficulties: play disrupted or prevented most of the time	2
No sibs/no opportunity to play with others	3
Not known	9

Sibs ☐ 69

Peers ☐ 70

Is *X* independent or does he/she cling a lot? C *X* be left with people he/she knows? At home does *X* follow you around all day . . . keep asking for attention . . . ask to have things done which could do for self, e.g. in feeding or dressing?

☐ 71

Reasonably independent for age	0
Some dependency: upset if left, takes some time to get over it: sometimes demands undue attention	1
Marked dependency. Cannot be left at all, continually demands to be with mother, or continually asking for attention	2
Not known	9

In the past 4 weeks has *X* been easy to manage or difficult? Do you ever feel *X* is out of control or difficult to discipline? How often is this?

☐ 72

Easy to manage and discipline	0
Sometimes difficult or out of control or hard to discipline for short periods	1
Long or very frequent periods, nearly every day, when difficult to manage or discipline	2
Not known	9

Does *X* have temper tantrums—shouting, screaming, banging, kicking? How often in the past 4 weeks. How long do they last?

☐ 73

No tantrums	0
Brief tantrums lasting a few minutes, 1 or 2 a day	1
Frequent tantrums 3 a day or more, or tantrums lasting more than 15 min	2
Not known	9

Is his/her mood usually happy or more often miserable or irritable?
How has *X* been in the past 4 weeks?
How often does this happen?

Usually happy except for brief periods	0	
Sometimes miserable/irritable/ discontented for periods less than 1 hr on most days and/or for longer periods once or twice a week	1	
Frequently miserable/irritable on most days and/or for long periods 3 times a week or more	2	
Not known	9	
		☐ 74

Is *X* a worrier? . . . gets anxious about something that might happen?
What about if *X* loses something . . . if people are away from home . . . falls, accidents in self or others . . . upsetting stories or TV programmes . . . new experiences like holidays, a new teacher, changes in doing things?

Never or rarely worried	0	
Some worries for brief periods	1	
Many different worries, or worries over certain things for long periods	2	
Don't know	9	
		☐ 75

(A worry is apprehension about something that may happen; a fear is apprehension about something thought to be present or actually present at the time)

Most children have some fears.
What is *X* afraid of? What about . . . Anything else?
Describe fears:
What does *X* do?

Scale A for individual fears

Not afraid	0
Somewhat afraid: uncertain about approaching, requires reassurance	1
Marked fear: runs away or avoids, clings to adult, cries, has to be comforted	2
Not known or no contact	9

Dogs	☐	1
Cats	☐	2
Other animals/insects	☐	3
Thunder, loud noises	☐	4
The dark	☐	5
Strangers	☐	6
Going out	☐	7
Car, bus, train, tube	☐	8
Lifts, escalators	☐	9
Water, the bath	☐	10
Haircut, hairwash	☐	11
Doctors	☐	12
Stories	☐	13
TV programmes	☐	14
	☐	15
	☐	16
	☐	17

Scale B for overall rating of fears

Is somewhat afraid of 1 or 2 things or has no fears	0
Has 1 or 2 marked fears or 3–5 fears altogether	1
Has 3 or more marked fears or 6 or more fears altogether	2

☐ 18

Is there anything about *X*'s behaviour or health we haven't mentioned?

☐ 19

Could you tell me what your husband's job is?
Father's occupation

☐ 20

Are you working?
Mother's occupation

That's all I wanted to ask. Thank you very much for your help.
Is there anything you'd like to ask me?

Informant:

Co-operation and reliability of informant

Good
Fair
Poor

Duration of interview ☐ ☐ ☐ minutes

COMMENTS

Name of interviewer ....

Date of interview ....

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REFRACTORY BEHAVIOUR AT SCHOOL IN NORMAL ADOLESCENT MALES IN RELATION TO PSYCHOPATHY AND EARLY EXPERIENCE

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INTRODUCTION

ALTHOUGH there is considerable concern expressed over troublesome behaviour of children in school, research has been largely directed towards evaluating management techniques, particularly the effects of reward and punishment (Kennedy and Willcutt, 1964; Marshall, 1965; Morrison and McIntyre, 1969; Newsom, 1963; Plowden, 1967; White and Lippitt, 1967). Other studies have explored the influence of teacher personality variables on children's learning and the maintenance of control (Harvey *et al.*, 1966; Kounin and Gump, 1961). While these studies may be useful in the selection and training of teachers, their emphasis is on the manipulation of stimulus input presented by adults rather than on the idiosyncratic response patterns that are elicited from the children.

This paper reports two small studies which form part of a series of exploratory investigations by the authors where the explicit aim has been to examine why some children respond differently to management techniques normally effective with most.

In many schools, the presence of a hard core of individuals who are not responsive to normal influences would be readily admitted. The characteristics of these individuals are:

1. They do not seem to profit from apparently unpleasant experience. Hence they are punished repeatedly for the same or similar misdemeanours.
2. They seem to lack the capacity to become involved in any close relationship and thereby preclude any positive advantages of working more closely with a teacher.
3. They seem unable to defer gratification of needs or to inhibit aggressive impulses. Hence they tend to become involved in truancy, theft and violent physical or verbal clashes with teachers or other pupils.
4. Although often socially adroit, they readily display suspicion of and hostility towards authority. Hence they are often deceptively "easy" to get on with until they are frustrated; they may engage impulsively in anti-social behaviour without any recognizable instigation.

The combination of impulsiveness, lack of feeling and suspicion of authority coupled with an apparent inability to profit from experience, creates a person who

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is particularly difficult to manage. In this paper, such individuals will be referred to as "refractory" to indicate that they are persistently difficult, deviant and anti-social in their behaviour without implying that such behaviour is technically delinquent.

Such behaviour could be construed as a failure in avoidance learning since many of these unrestrained actions inevitably expose such children to noxious stimuli. It is widely accepted that an essential pre-requisite of avoidance learning is the capacity to form conditioned "fear" responses (Mowrer, 1960). Such deficits, together with atypical function in at least some subsystems of the autonomic nervous system, have been studied with particular reference to psychopathic criminals (Tong and Murphy, 1960; Hare, 1965, 1965a, 1965b; McKerracher, 1968). Experimental studies in both autonomic functioning and avoidance learning of refractory children are to be reported by the present authors (Davies and Maliphant, 1971).

Adverse early experiences and deprivation generally have already been considered in relation to psychopathic behaviour (Bowlby, 1952, Bowlby *et al.*, 1956; McCord and McCord, 1966; Robins, 1966), but as far as is known, there has been no comparable study involving children manifesting a less extreme form of behaviour. The general hypothesis underlying this series of investigations is that refractory behaviour sufficiently resembles psychopathy to regard it as part of the same continuum.

AIMS

Two separate studies were designed to investigate:

1. The similarities between psychopathic behaviour and refractory behaviour, with particular reference to the dimensions of personality measured by the Psychopathic Deviant Scale (Pd) of the Minnesota Multiphasic Personality Inventory (M.M.P.I.) (Dahlstrom and Welsh, 1960).
2. The association of early experience, commonly considered as adverse and involving emotional deprivation, with refractory behaviour.

PROCEDURE

Psychopathy and refractory behaviour

The items that comprise the Pd scale were derived empirically from the answers of adult psychopathic criminals. A high score reflects a sense of boredom, alienation and resentment against society rather than anti-social proclivities *per se* (Butcher, 1969). The scores of delinquents, irrespective of whether the label of psychopath was applied to them, have been shown to be very similar to those of clinically diagnosed psychopaths. Hathaway and Monachesi (1963) administered the M.M.P.I. to 15,000 American adolescents and found a close association between high scores on the Pd Scale and convictions for delinquency. High scores were also found to precede the onset of delinquent behaviour. Gibbens (1963), in a study of English Borstal boys, has also confirmed that delinquents tend to score high on this scale.

If it is assumed that refractory boys tend to resemble psychopaths both in attitudes, behaviour and home circumstances, they should also show high scores on the Pd Scale of the M.M.P.I. although not as high as a psychopathic group, since they manifest less extreme behaviour and possibly have experienced less early adversity.

This part of the investigation was therefore designed to discover whether refractory subjects resemble psychopaths in the attitudes that the Pd Scale reflects.

Subjects. Subjects in both investigations were selected from an independent boarding school which offers an education to boys whose home circumstances require a boarding place for such reasons as the death, incapacity or absence overseas of a parent, or as a consequence of separation or divorce. The majority of the pupils had a home to return to for limited periods, such as school holidays, but the sample, although by no means to be considered formally as maladjusted or delinquent, cannot be considered typical of the normal school population. The children as a whole represented a wide range of adjustment problems in addition to variation in ability, attainments and social background.

The method of selection in the first investigation was made on the basis of teachers' ratings in the following manner. All the members of the teaching staff ($N = 14$) and the supervisor for out-of-school activities, who had contact with all boys in the school ($N = 240$), were asked to select one-third of the boys from each class whom they considered "refractory", A "refractory" boy was defined as "the sort of boy who constantly needs correction, seems indifferent to the threat of punishment as far as his behaviour is concerned, and who carries a chip on his shoulder". Boys in the fifth and sixth forms were excluded since they were liable to leave before the investigation could be completed. The size of the population thus evaluated was 174, with an age range of 11–16 yr. No boy was evaluated by less than 6 adults and most were evaluated by 8 or more. The supervisor evaluated all the boys. An analysis of the evaluations is presented in Table 1.

TABLE 1. ANALYSIS OF TEACHERS' EVALUATION OF REFRACTORINESS ($N = 174$)

	Nominated as refractory by 1 teacher or none	Nominated as refractory by 2/3 of teachers or more	"Intermediate" Group	Total
No. of Subjects	90	43	41	174

Teachers were asked to nominate one-third of each class as "refractory" for two reasons:

1. To minimize the implication that perhaps some teachers were experiencing more problems of discipline than others. It was considered that some teachers could be reluctant to nominate boys as refractory if this might be regarded as a reflection of their personal limitations.
2. Insistence on the nomination of one-third from each class, it was hoped, would ensure a sufficiently large pool of subjects about whose behaviour there was a high measure of agreement.

The 43 boys nominated by two-thirds or more of the staff as "refractory" were selected as the experimental group and matched for age and ability with a control group selected from the 90 subjects who received either one nomination only or none at all. It can be assumed that this latter group was generally well behaved. The children were streamed by class so that matching was accomplished by selecting refractory and non-refractory subjects from the same class whose ages were within 6 months of each other. Such pairing was then submitted independently to two members of staff who were asked to identify the experimental subject, the pairs being presented in a randomized order. In only one instance was there a wrong identification; this pair was excluded from the experiment.

The original experimental group of 43 boys was finally limited to 25 because 8 boys were unable to complete the Pd Scale for various reasons and 10 others were expelled.

Results. The difference in the scores for the two groups on the Pd Scale were significantly different (Table 2, $p = 0{\cdot}002$). A sign test (Siegel, 1956) was used since the subjects were matched and the results, as Fig. 1 and Table 2 indicate, were very clear-cut (viz. in only five pairs did the control subject have a higher score).

TABLE 2. REFRACTORINESS AND Pd SCORE

	Mean age	Mean Pd score	S.D.
Refractory subjects ($N = 25$)	14·2	21.6*	4·6
Control subjects ($N = 25$)	14.3	18·6*	4·8

*Pd scores of refractory subjects are significantly higher.
$p = 0{\cdot}0021$ (sign test; Siegel, 1956).

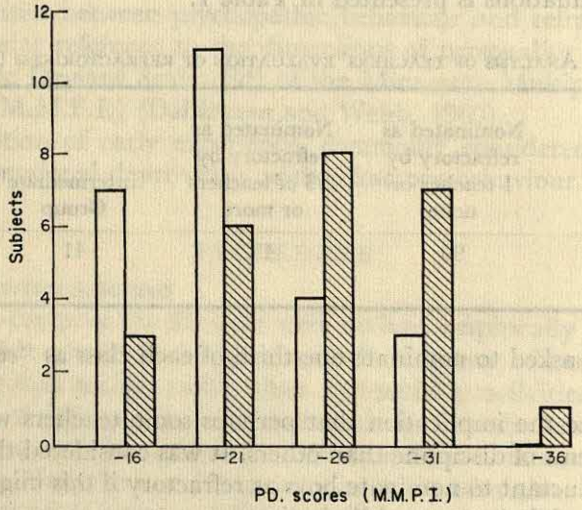

FIG. 1. Distribution of Pd scale scores (M.M.P.I.) of 25 refractory (hatched lines) and 25 control group subjects.

These results agree closely with Hathaway and Monachesi's (1963) much larger investigation of delinquent and non-delinquent adolescents and also with an earlier pilot study (unpublished). These findings are presented in Table 3, together with the scores of 10 boys expelled from the school.

TABLE 3. REFRACTORY BEHAVIOUR SCORES ON THE Pd SCALE OF THE M.M.P.I.

Study	Refractory group		Control group	
	Mean	S.D.	Mean	S.D.
Hathaway and Monachesi (delinquent sample)	21·5	—	19·5	—
Present investigation	21·6† ($N = 25$)	4·6	18·6 ($N = 25$)	4·8
Previous unpublished study—comparing extremes of groups rated for refractoriness by teachers	24·8† ($N = 10$)		14·9 ($N = 11$)	
Boys expelled ($N = 10$)	25·0	4·0	—	—

*$p = 0·0021$ (sign test).
†Significant at $p < 0·001$ (1-tail Mann Whitney 'u' test; Siegel, 1956).

Discussion. The results support the hypothesis that scores on the Pd Scale of the M.M.P.I. are significantly related to the refractory behaviour of boys not identified as delinquents. Further investigation would be required to ascertain how far such results would be applicable to a more heterogeneous group of boys attending a day school from their own homes.

Early experience and refractory behaviour

Subjects. This second investigation, carried out separately and at a different time from the first, used 33 boys, aged 11–16, attending the same school as the previous sample, arbitrarily selected on the basis of adequate information being given on their home background in their school records.

Procedure. The boys were divided into two groups. Group 1 ($N = 16$) included 7 boys whose homes were intact, who had been brought up happily by parents living happily together but who had been placed at the boarding school because of either the physical incapacities of one or both parents, or the parents were living overseas. A further 9 subjects whose homes had been broken by the death of the father when the child was more than 5 yr old were included on the assumption that the behavioural consequences of such an experience after that age were less likely to be serious.

Group 2 ($N = 17$) included 9 boys whose homes had been broken by divorce, desertion or separation and 8 others who had experienced many changes of parent surrogates in the first 10 yr of their lives. None of these 8 boys had lived with their fathers since early infancy and they were all in the care of the local authority.

Group 1 was arbitrarily designated as not having experienced adverse circumstances in early life. Group 2 was considered as the "adverse experience" group since divorce, desertion and separation, quite apart from any intrinsically disturbing features, is likely to be preceded by a lengthy period of disharmony (Robins, 1966). The mean age of these groups did not differ significantly (Table 4).

Three experienced members of the staff, including the headmaster, rated each boy on a 5-point scale for "refractoriness", defined as in the previous study. Inter-judge agreement was very high. In only 2 instances was there a discrepancy of more than one point between them. Such unanimity may of course only reflect the shared prejudices of staff rather than establish the ratings as valid indices of behaviour *per se*. All the boys were well known to the 3 members of staff. With 3 assessments for each boy, the range of scores for "refractoriness" was from 3 to 15. A final average score was obtained for each boy by dividing his total score by 3. The difference in scores as shown in Table 4 is significant at the 0·01 level.

TABLE 4. REFRACTORINESS AS A FUNCTION OF ADVERSE EARLY CIRCUMSTANCES

Group	No.	Mean age	Mean refractoriness score
I—Non adverse	16	14·7	1·95*
II—Adverse	17	14·4	2·775*

*Difference between scores significant.
$p < 0{\cdot}01$ (Mann-Whitney '*u*' test; Siegel, 1956).

Discussion. This limited investigation supports the view that early adverse experience can be associated with subsequent refractory behaviour in school. Clearly, a more extensive investigation is needed to confirm these findings and to relate finer qualitative differences in early experience to variations in subsequent behaviour.

CONCLUSIONS

High scores on the Psychopathic Scale (Pd) of the Minnesota Multiphesic Personality Inventory (M.M.P.I.) were found to be highly related to refractory behaviour of adolescent boys as assessed by their teachers. There was also a significant difference in teacher ratings of refractoriness in 2 groups of children who varied in the degree to which they had experienced adverse early circumstances.

These findings, although requiring replication on a larger and more heterogeneous sample, are consistent with others related to explicitly delinquent children (e.g. Bowlby, 1946, 1952; Gibson, 1969); they suggest that refractory behaviour has similarities to psychopathic behaviour as measured by the Pd Scale and that the Pd Scale might prove a useful objective index of such behaviour. The relationship of early adverse experience to refractory behaviour is also of interest in relation to similar findings in the study of psychopathic behaviour. There is sufficient congruence in these results therefore to suggest that refractory behaviour has similarities to psychopathic behaviour.

SUMMARY

Two studies of refractory behaviour in school of adolescent boys are reported. A close association between scores on the Psychopathic Deviant Scale (Pd) of the Minnesota Multiphasic Personality Scale (M.M.P.I.) and teachers' assessments of refractory behaviour suggest that such behaviour could be considered as being on the same continuum as psychopathy and that the Pd Scale might prove a useful index of it. Early adverse experience was also found to be related to refractory behaviour, as in psychopathy.

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A RELIABILITY STUDY OF PSYCHIATRIC DIAGNOSIS IN CHILDHOOD AND ADOLESCENCE

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INTRODUCTION

CLASSIFICATION in adult psychiatry, for better or worse, has been largely influenced by Kraepelinean nosology. During the past 50 years other classes of psychiatric disorder have been compiled, either complementary or supplementary to the original nomenclature, but by and large most of these efforts have been short-lived. Even the widely used American Psychiatric Association's D.S.M.-1 (1952) adapted from the International Classification of Diseases, I.C.D.-6 (1948) was superseded by D.S.M.-11 (1968) adapted from I.C.D.-8 (1965).

Taxonomists maintain, however, that all classifications are provisional and frequent change in classification is to be expected. Yet, many efforts to assess the reliability of psychiatric diagnosis and classification have been carried out. The results have varied. Any number of low agreement studies have been published—Doering and Raymond (1934), Masserman and Carmichael (1938), Elkin (1947), Ash (1949), Mehlman (1952) and Pasamanick *et al.* (1959), whilst with Seeman (1953), Schmidt and Fonda (1956), Kreitman *et al.* (1961), Beck *et al.* (1962) and Sandifer *et al.* (1964), the agreement rating has been found to be relatively high. However, Beck (1962) pointed out that any comparison of reliability studies must be qualified by knowledge of the setting, type of patient and nomenclature of the study.

Child psychiatry has not been so fortunate. There are several reasons why child psychiatrists have failed to agree even for a short period on a common classification. Huschka (1941) stated that it tends to obscure individual difference and prevents a more penetrating understanding of disorder. Szurek (1956) considered classification was unnecessary in distinguishing between different psychiatric categories. Harrison (1968) commented that child psychiatry has not produced a Kraepelin and the fluidity of the developmental dimensions of childhood did not lend itself to static categorization. On the other hand, Ashburner (1968) held the optimistic view that in recent years there has been renewed interest in classification in child psychiatry, one manifestation of this being the Group for the Advancement of Psychiatry (G.A.P.) (1966) classification.

By 1967, the Section of Child Psychiatry, Australian and New Zealand College of Psychiatrist (A.N.Z.C.P.), had some members scrutinizing the G.A.P. (1966)

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classification. In Victoria, Ashburner (1968) concentrated on the accommodation of a G.A.P. classification addendum to the Australian Glossary of Mental Disorders (1967). In New South Wales Freeman (1967) prepared a synopsis and critique of the G.A.P. classification, and in 1968 a G.A.P. Subcommittee* was established to plan and conduct a pilot study on the classification. The following reliability study was undertaken to assess various aspects of levels of agreement on psychiatric diagnosis using the G.A.P. classification.

Method

The G.A.P. Subcommittee had no case material of its own, and therefore requested the submission of 2 typed case histories from each of the 22 psychiatrists who volunteered participation. They were not asked at this stage to commit themselves to a diagnosis. This produced 44 case histories. Two psychiatrists withdrew from the study, leaving 20 diagnosticians to complete it. Three months after completion of the 44 cases, 6 cases, selected at random, were reissued as a test–retest study on the 20 diagnosticians. The diagnosticians had no knowledge of the findings from the 44 cases and were unaware of a test–retest study.

Diagnosticians. The diagnosticians, 14 male and 6 female, are all members of the A.N.Z.C.P. and members of the New South Wales Section of Child Psychiatry. The individual years of general psychiatry experience ranged from 4 to 28 yr with a mean of 13 yr; experience in child and adolescent psychiatry ranged from 2 to 24 yr with a mean of 8 yr. The types of psychiatric practice were: 6 diagnosticians employed in paediatric hospitals, 7 in Child Health Centres, 2 in a children's ward in a psychiatric hospital, 2 in private practice, 2 with the Department of Child Welfare and 1 in a hospital for the mentally retarded. The 20 diagnosticians were then sent typed copies of the 44 case histories; attached to each case was a G.A.P. Diagnosis Sheet which required completion no matter how difficult the case should prove to be. If necessary, as suggested by G.A.P. the diagnostician could make a double diagnosis. The G.A.P. Diagnosis Sheet was compiled as follows:

A (1) Category
(2) Subcategory
B (1) Category
(2) Subcategory
C Criticism

Definitions. For this study the terms used are defined as follows:

1. "Original study" means the findings from the 44 cases diagnosed by the 20 diagnosticians.
2. "Majority agreement" means 11–20 diagnosticians selected the same category for a particular case.
3. "Minority agreement" means 5–10 diagnosticians selected the same category for a particular case; this represents the highest agreement for that case.
4. "Popular category" is the category selected with the highest agreement for each of the 44 cases.
5. "Second choice" is the category with the highest agreement, after the "popular category", for each of the 44 cases.

*See acknowledgements.

6. "Subcategory" is the subtype of a category as proposed by G.A.P.
7. "Double diagnosis" is the use of a second diagnostic category for the equivocal case and/or to complement or supplement the "popular category".
8. "Retest category" is the selection of a category in the test–retest study.

Nomenclature. The G.A.P. Committee on Child Psychiatry proposed ten diagnostic categories.

1. Healthy responses(3*)
2. Reactive disorders
3. Developmental deviations (2*)
4. Psychoneurotic disorders (7*)
5. Personality disorders (13*)
6. Psychotic disorders (3*)
7. Psychophysiological disorders (11*)
8. Brain syndromes (2*)
9. Mental retardation
10. Other disorders.

DATA ANALYSIS AND DISCUSSION

Overall distribution of category by diagnostician

Table 1 summarizes the overall distribution of diagnosis by category. The most important findings are:

(i) Four categories, Reactive disorders, Psychoneurotic disorders, Personality disorders and Psychotic disorders, account for 728 (83 per cent) of the 880 diagnoses.

(ii) Five categories, Developmental deviations and four Combined categories (Healthy responses (11 diagnoses), Psychophysiological disorders (23), Brain syndromes (38) and Mental retardation (2)) account for 152 (17 per cent) of the 880 diagnoses.

(iii) The category Other disorders was not used.

(iv) The categories Psychotic disorders and Developmental deviations were selected with almost the same frequency. However, the diagnosticians used Psychotic disorders for only 9 cases in comparison with Developmental deviations, 27.

(v) The category Psychoneurotic disorders was selected with little variation by 18 diagnosticians, but the categories Reactive disorders and Personality disorders were used by 12 diagnosticians with considerable variation. (χ^2 was calculated for each diagnostician for each category (Langley, 1968). A critical examination of each diagnostician's qualifications and experience failed to explain the extreme differences in using these two categories. Even when the diagnostician selected one category as a first diagnosis in a "double diagnosis", not one diagnostician had a substantial number of the other category as a second diagnosis.

It should be noted that a number of diagnosticians stated that some of the case material did not state clearly the duration of the complaint. Consequently the diagnostician was left with a degree of uncertainty as to whether the complaint was transient (Reactive disorder) or persistent (Personality disorder). This to some extent is confirmed by the frequency with which the diagnoses by each of the 20 diagnosticians was included in the "popular category" on their own 2 cases.

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*Represents the number of subcategories in the category.

TABLE 1. THE DISTRIBUTION OF DIAGNOSES IN THE G.A.P. CATEGORIES

Diagnosticians	Categories					
	Reactive disorders	Psycho-neurotic disorders	Personality disorders	Psychotic disorders	Develop-mental deviations	Combined categories†
1	10	11	5*	5	8*	5
2	16*	7	10	4	2	5
3	23*	6	5*	4	4	2
4	15	6	16*	4	2	1
5	10	11	9	6	5	3
6	11	8	9	4	6	6
7	10	7	7	4	8*	8
8	16*	13	4*	3	3	5
9	13	16*	5*	3	6	1
10	10	11	13	5	4	1
11	13	11	7	5	3	5
12	18*	10	7	4	2	3
13	7	9	7	5	7*	9
14	19*	6	10	4	5	
15	4*	8	20*	4	2	6
16	8	9	17*	4	3	3
17	15	11	7	6	2	3
18	2*	11	26*	3	2	
19	9	21*	4*	5	2	3
20	15	12	6	4	2	5
Total	244	204	194	86	78	74
Percentages	28	23	22	10	9	8

Case histories = 44; diagnosticians = 20.

*Denotes significant extremes in the use of a category, excluding combined categories.

†Combined categories—Healthy responses, Psychophysiological disorders, Brain syndromes and Mental retardation.

For 7 out of the 20 diagnosticians, their own 2 diagnoses were included in the "popular category".

For 11 out of 20 diagnosticians, 1 of their own diagnoses was included in the "popular category".

For 2 out of 20 diagnosticians, their own 2 diagnoses were not included in the "popular category".

This placed 25 (62 per cent) out of the 40 diagnoses in the "popular category" for each one of the 20 diagnosticians on their respective cases whilst 15 (38 per cent) diagnoses rendered by the 20 diagnosticians failed to reach "minority agreement" rating. The latter percentage points out a difference in diagnostic technique between direct and indirect consultation on a case.

As no other explanation for using the two categories could be ascertained for any diagnostician on the grounds already assessed, it was then considered that certain diagnosticians might be influenced by their type of psychiatric practice. The diagnosticians were divided into three groups according to type of psychiatric practice (refer to diagnosticians under Method).

Table 2 shows the number of times the groups of diagnosticians used the categories Reactive disorders and Personality disorders. There is a significant difference between the frequency with which the 3 groups used the diagnostic categories.

TABLE 2. THE DISTRIBUTION OF DIAGNOSES ACCORDING TO TYPE OF PSYCHIATRIC PRACTICE

		Categories			
Employment of diagnostician		Reactive disorders	Personality disorders	Combined	Total
Group A. Paediatric hospitals	(6)	87	65	112	264
Group B. Child health centres	(7)	87	63	158	308
Group C. Other employment	(7)	70	66	172	308
Total	(20)	244	194	442	880

Overall $\chi^2 = 11{\cdot}02; df = 4; p > 0{\cdot}05$.
A × C $\chi^2 = 11{\cdot}20; df = 2; p > 0{\cdot}01$.
A × B—Not significant.
B × C—Not significant.

Diagnostic agreement on the 44 *cases*

Table 3 shows the extent of agreement between the 20 diagnosticians. There is high agreement on 10 cases, a moderate on 11, and a marginal on 10, which gives an overall "majority agreement" on 31 (70 per cent) of the 44 cases. In 13 (30 per cent) cases there is a "minority agreement". These figures compare favourably with the studies carried out on adult patients by Beck *et al.* (1962) and Sandifer *et al.* (1964).

TABLE 3. EXTENT OF DIAGNOSTIC AGREEMENT

Agreement by	44 Cases	Percentage agreement
20 Diagnosticians	2 cases	100
	10	
16–19 Diagnosticians	8 cases	80–95
13–15 Diagnosticians	11 cases	65–80
11–12 Diagnosticians	10 cases	50–65
Majority agreement total	31 (70%)	
Minority agreement total (5–10 Diagnosticians)	13 (30%)	25–50

Table 4 shows the levels of agreement of the diagnosticians for each category. The 6 categories in Table 4 represent the "popular categories" as the other 4 categories failed to reach "minority agreement" rating. For the 4 categories, Reactive disorders, Psychoneurotic disorders, Personality disorders and Psychotic disorders, "majority agreement" has been reached for, from 70 to 84 per cent of cases. Brain syndromes have a 50 per cent "majority agreement" and Developmental deviations have a "minority agreement" rating. There is a significant agreement for 41 cases with the ZI test (Langley, 1968). By comparison, Fletcher (1952) reported on 19 to 33 per cent disagreement on 9 abnormal respiratory signs by 8 chest physicians.

TABLE 4. THE DIAGNOSTIC AGREEMENT RESULTS IN THE POPULAR CATEGORIES

			Popular categories				
Agreement by	Reactive disorders	Developmental deviations	Psychoneurotic disorders	Personality disorders	Psychotic disorders	Brain syndromes	Total
20 Diagnosticians					2		2
16–19 Diagnosticians	2		3	3			8
13–15 Diagnosticians	5		3	1	1	1	11
11–12 Diagnosticians	4		2	3	1		10
Majority agreement	11		8	7	4	1	31
	(84%)		(72%)	(70%)	(80%)	(50%)	(70%)
Minority agreement	2	3	3	3	1	1	13
(5–10 Diagnosticians)	(16%)	(100%)	(28%)	(30%)	(20%)	(50%)	(30%)
Total	13	3	11	10	5	2	44

Reliability of diagnosis by popular category

From the 880 diagnoses rendered, 549 (62 per cent) were accounted for by the "popular categories" and 231 (38 per cent) failed to reach the "minority agreement" level. For each case from the 6 "popular categories", the following question was asked: If one diagnostician selects a category for a particular case, what is the likelihood that the other 19 diagnosticians will select the same category?

The reliability percentage was calculated from the formula

$$\frac{\text{observed number of diagnoses}}{\text{expected number of diagnosis}} \times 100$$

e.g. 10 cases of Personality disorders =

$$\frac{121 \text{ (observed diagnoses)} \times 100}{10 \times 20 \text{ (expected diagnosis)}} = 61 \text{ per cent.}$$

The reliability for the 4 categories, Reactive disorders (162 diagnoses), Psychoneurotic disorders (149), Personality disorders (121), and Psychotic disorders (72) range between 61 and 72 per cent which is approximately 10 per cent lower than the range 70 to 84 per cent for "majority agreement" for each category. Hence it can be assumed from these findings that the above 4 categories are the most reliable when selected for diagnosis in the G.A.P. classification. The reliability for all "popular categories" is the mean of the 6 individual reliabilities, which is 59.

The question of reliability by category was explored further by asking: If some of the diagnosticians do not agree with a "popular category" for a case, what other category are they likely to use?

Table 5 shows the findings:

The figures in the circles are the total number of cases for the 6 "popular categories".

The figures in the lined small squares indicate the number of cases for the "second choice categories", e.g. case No. 20 from the study.

13/20: the "popular category" is a Psychoneurotic disorder
4/20: the "second choice" is a Reactive disorder
3/20: the third choice is a Psychophysiological disorder.

Therefore Reactive disorders is the second choice.

TABLE 5. A COMPARISON OF THE NUMBER OF DIAGNOSES BETWEEN THE POPULAR AND SECOND CHOICE CATEGORIES

	Second choice categories							
	1	2	3	4	5	6	7*	
Popular categories	R.D.	D.D.	Ps.N.	P.D.	Ps.Ch.	B.S.	Ps.Ph.	Total
1 Reactive Disorders (R.D.)	⑬	4	2	$\boxed{5}$			2	13
2 Developmental Deviations (D.D.)	$\boxed{3}$	③						3
3 Psychoneurotic Disorders (Ps.N)	$\boxed{8}$	1	⑪	1	1			11
4 Personality Disorders (P.D.)	$\boxed{4}$	3	2	⑩		1		10
5 Psychotic disorders (Ps.Ch.)	1		1	1	⑤			5
6 Brain syndromes (B.S.)	1		1			②		2
Total	17	8	6	7	1	1	2	42/44†

*Psychophysiological disorders.

†Two cases with 100 per cent agreement in the popular category.

Table 5 shows that Reactive disorders category is the most used "popular category" but also the most frequently used "second choice". Even as a "second choice", Healthy responses and Mental retardation have not been used and Psychophysiological disorders and Brain syndromes have limited use.

When Reactive disorders is the "popular category", Personality disorders is the "second choice".

Category distribution with patient age

The diagnosticians were not asked to submit cases of a specific age but the cases conveniently divided into the 3 age groups as defined by G.A.P.

(i) Early childhood (2– 5 yr)—11 cases
(ii) Late childhood (5–12 yr)—20 cases
(iii) Adolescence (12–18 yr)—13 cases

Table 6 presents the distribution of the categories according to the age of the patient. The figures in the circle indicate the category(ies) with the highest number in a particular age group. The "majority" and "minority" agreement ratings in the 3 age groups were:

(i) Early childhood — 7 and 4 cases
(ii) Late childhood — 14 and 6 cases
(iii) Adolescence — 10 and 3 cases

The distribution indicated that there is no significant difference in the number of "majority" and "minority" agreements for the 3 age groups in relation to the total number for each age group, Fisher-Exact Test $p > 0{\cdot}50$ (Langley, 1968). Hence the diagnosticians used the classification with the same degree of reliability for the 3 age groups.

TABLE 6. THE DISTRIBUTION OF DIAGNOSES IN THE POPULAR CATEGORIES IN RELATION TO PATIENT'S AGE

	Patient's age, yr			
Popular categories	2–5	5–12	12–18	Total
1 Reactive disorders	⑦	⑥		13
2 Developmental deviations	1	2		3
3 Psychoneurotic disorders		⑥	5	11
4 Personality disorders	1	3	⑥	10
5 Psychotic disorders	2	1	2	5
6 Brain syndromes		2		2
Total	11	20	13	44

TABLE 7. THE LEVELS OF AGREEMENT FOR SUBCATEGORIES IN FOUR POPULAR CATEGORIES

		Subcategories			
Percentage agreement	No. of cases	Psychoneurotic disorders (7)*	Personality disorders (13)*	Psychotic disorders (3)*	Brain syndromes (2)*
100	4	1		2	1
80–95	3	2	1		
65–80	7	2	4	1	
50–65	2	2			
Majority agreement	16	7	5	3	1
Minority agreement					
25–50	4	1	2	1	
Total	20/31†	8	7	4	1

*Number of subcategories/category.

†11 cases diagnosed as reactive disorders (no subcategory).

Level of agreement with subcategories

Five "popular categories" have "subcategories" but only 4 out of the 5 reached "majority agreement" rating in 20 out of the 31 cases. Table 7 shows the distribution of the levels of agreement for "subcategories" in the 4 categories.

Sixteen of the 20 cases had a "majority agreement" rating for "subcategories". There is high agreement on 7 of the cases, moderate on another 7, marginal on 2 and a "minority agreement" on 4. Amongst the "minority agreement" is a Psychotic disorder which requires a choice of only 1 out of 3 "subcategories".

Use of double diagnosis

Out of the 880 diagnoses, 243 (27 per cent) had a "double diagnosis". The number varied from 1–13 "double diagnoses" for a particular case with a mean of 5 "double diagnoses" to each case. On the other hand the diagnosticians' use of a "double diagnosis" varied, from 1 "double diagnosis" by one diagnostician to 26 by another out of the 44 cases; with a mean of 12 double diagnoses per diagnostician.

The hypothesis was then tested that the "double diagnosis" is associated with cases in which there is a "minority agreement". Table 8 shows the findings. Approximately 35 per cent of both the majority and minority agreement cases have a "double diagnosis". These findings indicate no significant association between "double diagnosis" and "minority agreement" cases. It seems pertinent to add that some diagnosticians reported that they found it necessary to use a "double diagnosis" not only for the equivocal case but also to complement or supplement the "popular category".

TABLE 8. THE RELATIONSHIP BETWEEN DIAGNOSIS AND AGREEMENT RATINGS

		Diagnosis		
Cases	No.	Single	Double	Total
Majority agreement	31	286 (65%)	156 (35%)	442
Minority agreement	13	70 (65%)	37 (35%)	107
Total	44	356	193	549*

*231 cases failed to reach the minority agreement level.

The most frequently used second category in the "double diagnosis" was Personality disorders which accounted for 104 (43 per cent) out of the 243 "double diagnosis". Next frequent was Brain syndromes with 41 (17 per cent) and the other 98 (40 per cent) cases were evenly distributed amongst Developmental deviations, Psychoneurotic disorders, Psychophysiological disorders and Mental retardation categories.

Test–retest study

After a lapse of 3 months, 6 of the 44 cases were selected at random and given to the 20 diagnosticians for assessment. From the 120 diagnoses, there were 86 (72 per cent) in the same diagnostic category as was assigned on the first occasion. The 6 cases diagnosed were placed by the diagnosticians as a group in the same 6 categories as they were in the "original" study.

The consistency of diagnosis by the 20 diagnosticians varied (Table 9) with a mean of 4·3 out of the 6 cases having given the same diagnosis in the "retest category". This represents approximately a mean intraindividual change of 28 per cent.

How does this intraindividual inconsistency compare with similar studies in other medical specialities? Yerushalmy *et al.* (1951) reported on the interpretation and re-interpretation of serial roentgenograms of the chest. Six experts, 3 chest physicians and 3 radiologists, independently interpreted 150 paired films of the chest into

TABLE 9. THE RANGE OF DIAGNOSTICIAN CONSISTENCY IN THE RETEST STUDY

Retest cases in agreement	No. of diagnosticians	Percentage agreement
6/6	3	100
5/6	6	83
4/6	7	67
3/6	3	50
2/6		33
1/6	1	17
Total	20	

Case histories = 6; diagnosticians = 20.

(i) Better; (ii) No change; and (iii) Worse categories. Three months later and without knowledge of the results of the first interpretation, the same films were re-interpreted by the same readers with an intraindividual change of 22 per cent. Similarly, Davies (1956) studied the interpretation and re-interpretation some weeks later, of the 100 electrocardiograms reported by 10 cardiologists as: (i) Myocardial infarcation; (ii) Abnormalities other than infarcation; and (iii) Normal. All 10 cardiologists were found to have changed their opinions on a certain proportion of the ECG's of the 3 categories with a mean intraindividual change of 20 per cent.

The intraindividual inconsistency of categorization by the diagnosticians in the retest study was most noticeable in 3 cases which accounted for 26 (9, 11 and 6 respectively) out of the 34 disagreements. The level of interindividual agreement on the same 3 cases (11, 14 and 11 respectively) was lower than in the remaining cases (19, 20 and 16 respectively). Therefore it can be said that the 20 diagnosticians were inconsistent to a large extent in the cases with lower "majority agreement", i.e. the interindividual and intraindividual inconsistencies of the diagnosticians are closely related.

CONCLUSIONS

The study clearly established that the diagnosticians used to a very large extent the four categories, Reactive disorders, Psychoneurotic disorders, Personality disorders and Psychotic disorders.

(83 per cent of the diagnoses rendered; 39/44 of the cases selected as the "popular category"; a majority agreement" range from 70 to 84 per cent and a reliability of diagnosis by "popular category" range from 60 to 72 per cent.)

The new categories G.A.P. (1966),* Healthy responses and Developmental deviations, were not often selected.

(10 per cent of the diagnoses rendered and 3 cases selected as the "popular category" with "minority agreement" rating.)

The minimal use of the categories Mental retardation and Brain syndromes† was not expected but the likely explanation for this was most case histories contained no information which would justify the diagnostician selecting either of these categories.

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*See p. 210.

†Two cases were selected as the "popular category".

The level of "majority agreement" on "subcategories" was at a lower level of agreement than for the 4 "popular categories". The distribution of "popular categories" in relation to patient age showed a preponderant use of residual* categories associated with early childhood; and a total use of the definitive* categories associated with adolescence (Ashburner, 1970).* The classification was used with the same degree of reliability for the 3 age groups.

"Double diagnosis" was used in 27 per cent of the diagnoses. These were used significantly to complement or supplement the "popular category" and not necessarily for the equivocal case. Personality disorders was the most frequently used second category.

In the test–retest study, 72 per cent out of the 120 retest diagnoses were in agreement with the original choice. There was no change in the category selection between the "original" and "retest" studies and the intraindividual changes of the diagnosticians ranged from 1 to 6 out of the 6 cases with a mean of 4·3.

SUMMARY

The reliability study on the G.A.P. classification by 20 psychiatrists has demonstrated a high interindividual and intraindividual consistency. This diagnostic consistency is equal to the findings of any high agreement study in adult psychiatry and comparable with diagnostic error reported in other medical specialities. Garland (1959) proposed that all forms of clinical practice have a measurable degree of diagnostic error and if all branches of medicine could be tested this phenomenon would probably be quite universal. The New South Wales study on the G.A.P. classification has confirmed that child psychiatry is no exception to this rule.

*Residual categories—Reactive disorders and Developmental deviations. Definitive categories—Psychoneurotic disorders, Personality disorders, Psychotic disorders, Psychophysiological disorders, Brain syndromes and Mental retardation.

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COGNITIVE STYLES IN HYPERACTIVE CHILDREN AND THE EFFECT OF METHYLPHENIDATE

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A large number of descriptive articles have appeared in recent years on three rather general and vaguely defined childhood syndromes. These include hyperactivity or the hyperkinetic syndrome, minimal brain dysfunction, and learning disabilities (Clements and Peters, 1962; Eisenberg, 1966; Laufer, Denhoff and Solomons, 1957; Paine 1962; Werry, Weiss, and Douglas, 1964). Despite the variety of labels, similar behavioural descriptions often emerge, the most common being distractibility, low frustration tolerance, short attention span, inability to sit still, and school failure. These children generally do not learn efficiently, despite average or above average intelligence. This problem is often accompanied by difficult behaviour both at home and at school and thus frequently results in referral to a child guidance clinic in the early school years.

Since these symptoms often occur together, there has been a tendency to use the above diagnostic labels interchangeably. For example, a child who is having difficulty in paying attention and learning to read may be diagnosed as hyperactive, minimally brain damaged, or learning disabled depending on the bias of the diagnostician. Many authors assume that these behaviours must co-vary. Thus a child who is overactive and distractible is often assumed to have conceptual and perceptual-motor difficulties (Clements and Peters, 1962). Similarly, people who write about learning disabilities tend to assume that such children are hyperactive and distractibile (McCarthy and McCarthy, 1969; Paine, 1962). However, there have been few attempts to define specific behavioural syndromes and then to study the kinds of learning deficiencies which accompany each syndrome.

We have been attempting to delineate more clearly the behavioural abnormalities and learning characteristics of children who have been diagnosed as hyperactive or hyperkinetic. Our basic strategy has been to select a core behavioural symptom, that of excessive activity, and to study the cognitive problems of children diagnosed as hyperactive. A second goal has been to investigate the effects of the energizing drugs on the cognitive performance of these children. Thus, we have been asking two basic questions. First, when hyperactive children are compared with normal children what specific cognitive and learning deficits emerge? Second, are the energizing drugs, which seem often to alleviate the behavioural symptoms displayed by hyperactive children (Millichap and Boldrey, 1967; Sainz, 1966), also successful in alleviating the cognitive and learning problems delineated by the hyperactive-normal comparisons?

Thus far, the research has produced considerable evidence that our hyperactive

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subjects are experiencing severe problems in school. Using an observational technique in the classroom, Douglas, Weiss and Minde (1969) found that hyperactive children were less attentive, more disruptive, and received poorer grades than normal controls. On the other hand, when the hyperactive group was assessed individually and compared with normal children on an extensive battery of tests to diagnose specific learning disabilities, the only pattern of deficits which emerged was suggestive of a perceptual-motor problem. On the majority of tests, there was no difference between groups. This was true even on several tests tapping perceptual-motor skills. Clear-cut differences between hyperactive and normal children were obtained, however, on measures of sustained attention and motor inhibition (Cohen, Douglas and Morgenstern, 1969; Sykes, Douglas and Morgenstern, 1969). On the other hand, despite reports that hyperactive children have conceptual deficits (Clements and Peters, 1962), no differences were observed on a concept learning task as long as the children were given continuous feedback (Freibergs and Douglas, 1969).

In view of these findings it seemed possible that behavioural traits which pervade problem solving and interfere with efficient learning may be sufficient to explain the poor school performance of the hyperactive child. Douglas *et al.* (1969) have argued that even the apparent perceptual-motor problems may be at least partly attributable to these more general and pervasive behavioural traits. Thus, we decided to concentrate on the style or approach hyperactive children typically employ in problem solving situations to see whether these differentiate them from normal children.

A growing body of recent data in experimental psychology has linked problem solving to several cognitive styles, among them individual differences in speed of decision making (Kagan *et al.*, 1964) and the ability to focus attention (Gardner and Long, 1962), to respond rapidly to simple repetitive tasks (Broverman, Broverman and Klaiber, 1966), and to structure a stimulus field (Witkin *et al.*, 1962). These individual differences or cognitive styles appear to be pervasive aspects of problem solving behaviour which reflect differences in attentional and impulse control rather than differences in cognitive skills or intellectual ability (see Klein, 1958). Thus, it seemed that a controlled study of the cognitive styles of hyperactive children might suggest new insights about their problem solving behaviour as well as directions for treatment and educational planning.

Cognitive styles

Reflection–impulsivity. Kagan *et al.* (1964) have demonstrated that one factor contributing to differences in cognitive functioning is the child's cognitive tempo, his habitual speed of decision making in situations with high response uncertainty. Using a visual matching task, Kagan (1965a) has obtained a consistent negative relationship between response speed and accuracy. Thus, the performance of the reflective child is characterized by long latencies and few errors. The impulsive child, on the other hand, has very short reaction times and makes a large number of errors. He tends to respond immediately with little critical evaluation of alternatives.

Normal children scoring high on impulsivity measures have been found to make more errors of commission on a serial learning task (Kagan, 1966), to make more reading errors (Kagan, 1965b), and to have higher error scores on tests of inductive reasoning (Kagan, Pearson and Welch, 1966b). They have also been observed to be more distractible, less attentive, and more physically active than their reflective peers (Kagan *et al.*, 1964). In view of the similarity between these traits and the typical clinical description of the hyperactive child, it seemed worth determining whether hyperactive children received higher scores than normal children on Kagan's measure of impulsivity.

Field dependence–independence. Witkin's dimension of field dependence–independence reflects individual differences in the ability to separate an item from the field in which it is embedded (Witkin, 1959; Witkin *et al.*, 1962). This dimension is also conceptualized in terms of differences in the degree to which preception is global and diffuse or structured and analytic (Witkin *et al.*, 1962). The field independent individual is better able to overcome a confusing, embedding context when isolating figure from ground (Witkin *et al.*, 1962). Witkin *et al.*, using projective techniques, have demonstrated that field independent boys are more emotionally independent and display better control over impulses than field dependent boys. Moreover, field independent boys are more concerned with intellectual mastery and tend to persist longer than field dependent boys on difficult intellectual tasks.

These same authors have suggested that children who show extremes in activity level manifested in undirected motor output and poor impulse control should perform in a field dependent manner, since they would be expected to respond globally to the most compelling aspects of the stimulus field. This reasoning was tested in the present research with the prediction that hyperactive children would be more field dependent than control children.

Constricted–flexible control. The cognitive style of constricted–flexible control reflects differences in the ability to ignore distracting and contradictory cues (Klein, 1954) and to inhibit incorrect verbalizations (Gardner and Long, 1962). Santostefano (1964) has demonstrated that brain damaged children and children with reading problems (Santostefano, Rutledge and Randall, 1965) show more constricted control of attention than normal children, presumably because they are less able to focus on relevant stimulus attributes. Since hyperactive children are characterized by poor attentional and impulse control (Eisenberg, 1966), it was anticipated that they would have greater difficulty than normal children ignoring intrusive information and inhibiting incorrect verbalizations, i.e. that they would display constricted control of attention.

Automatization. Finally, the ability to respond rapidly to simple repetitive tasks appears to reflect differences in the ability to over-learn routine material (Broverman *et al.*, 1966). Broverman *et al.* suggest that people who perform rapidly on measures of automatization have more attentional energies available for new learning. Moreover, one manifestation of strong automatization is the ability to resist distractions when faced with highly familiar material (Broverman, 1960). Weak automatizers fatigue more readily than strong automatizers, and thus have difficulty maintaining rapid response rates (Broverman *et al.*, 1966). Finally, rapid responses to repetitive stimuli demand concentration and persistence, and such tasks provide minimal novel stimulation. Since hyperactive children are reported in the clinical literature to be poor in concentration, low in persistence, and easily distracted by extraneous input, they would be expected to maintain a less efficient response rate to repetitive tasks than normal children.

In summary, it was expected that hyperactive children would be more impulsive, more field dependent, more constricted in their ability to control attention, and slower on measures of automatization than matched normal control children.

Stimulant drugs

There is some evidence to suggest that energizing drugs such as the amphetamines and methylphenidate are effective in the treatment of hyperactivity (Bradley, 1950; Knobel, 1959; Martin, 1967). Methylphenidate has received considerable attention in this field recently since it has been reported to decrease hyperactive behaviour and related symptoms (Knobel, 1962; Sainz, 1966) and to have fewer side effects than the amphetamines (Millichap and Fowler, 1967; Sainz, 1966).

Several studies provide evidence that methylphenidate improves the classroom behaviour of hyperactive children (Eisenberg, Conners and Sharpe, 1965; Knights and Hinton, 1969; Millichap and Boldrey, 1967). On the other hand, the effect of methylphenidate on cognitive and learning capacity is less clear-cut. For example, Douglas *et al.* (1969) have reported an improvement in WISC Verbal I.Q. scores while Knights and Hinton (1969) found that their drug-treated group improved on the Picture Completion, Block Design, and Coding subtests resulting in a significant increase in Performance I.Q. Eisenberg *et al.* (1965) found that methylphenidate improved school grades and Porteous Maze performance and Douglas *et al.* (1969) report an improvement in motor skills as measured by the Lincoln-Oseretsky Scale of Motor Development. Knights and Hinton (1969), on the other hand, found no improvement on motor steadiness measures on a stylus maze task, although they did observe that their subjects corrected errors more rapidly while on the drug. Methylphenidate has been found to improve the performance of hyperactive children on tasks requiring sustained attention to auditory and visual stimuli (Sykes *et al.*, 1969) and to speed up performance on a reaction time task (Cohen *et al.*, 1969). These inconsistencies in drug effects may suggest that the drug is not specifically improving motor control, verbal ability, or perceptual skills, but is affecting the hyperactive child's style of coping with cognitive tasks.

In the second phase of this study, the effect of methylphenidate on the four cognitive styles described above was investigated. It was felt that if the hyperactive group did show less efficient problem solving strategies than normal children, as predicted, then a critical test of the drug's effectiveness would be its ability to produce improvement in areas where the hyperactive children had been shown to be impaired.

STUDY 1—HYPERACTIVE-NORMAL COMPARISONS

Method

Subjects. A total of 19 children diagnosed as hyperactive and 19 matched control children took part in the first study. The clinical group had been referred to the Psychiatric Clinic of the Montreal Children's Hospital. In order to obtain as homogeneous a group as possible, all potential hyperactive *S*s were screened by a psychiatrist and psychologist to determine whether they met the criteria for inclusion in the study. *S*s were accepted into the study only if hyperactivity was the chief complaint, had been a chronic problem from early childhood, was present throughout the day, and was reported to be a problem by both parents and school.

Subjects were not accepted if they displayed gross signs of brain damage or if hyperactivity was a symptom which appeared to be secondary to some other problem such as psychosis, neurosis, or aggressive behaviour disorder. Only *S*s of at least dull normal intelligence were included (WISC I.Q. of 80 or above). All *S*s were living at home and were seen on an out-patient basis. None of the hyperactive children was receiving any kind of drug or psychotherapy at the time of testing. Of the 19 *S*s in the hyperactive group, 17 were boys and 2 were girls. They ranged in age from 5 yr 9 months to 11 yr 4 months, with a mean of 7 yr 9 months. I.Q.s ranged from 85 to 128 with a mean of 102·7. All children were from middle-class backgrounds.

The control group consisted of children who attended schools in the Montreal area. They were selected from schools in middle-class areas on the basis of age, sex, and any available information on intelligence, so as to match a hyperactive child. The parents of each child were then contacted by letter, and if they agreed to participate in the study, an appointment was made. Only children who matched a hyperactive child on age, sex, socio-economic level, and WISC I.Q. were included in the final control group.

The control group ranged in age from 5 yr 9 months to 11 yr 5 months with a mean of 7 yr 9 months. A *t*-test for matched groups indicated that the groups were well matched on age ($t = 0{\cdot}55$). The I.Q.s of the control group ranged from 88 to 129 with a mean of 103·6. The difference between groups was not significant ($t = 1{\cdot}42$).

Procedure. Hyperactive and control children were tested at McGill University. Testing was completed in one session.

Test administration

Reflection–impulsivity. The Matching Familiar Figures Test (Kagan *et al.*, 1964) was used to measure reflection–impulsivity. It consisted of 14 sets of pictures of familiar objects and animals, two practice and 12 test items. *S* was shown a standard stimulus and six similar ones and was required to choose the one picture from among the six alternatives which was identical to the standard. The standard and six choices were presented simultaneously. If *S* made an incorrect choice, he was told to look again. Up to six trials were allowed per item. Variables scored were latency to first response and number of errors.

Field dependence–independence. The Children's Embedded Figures Test (Karp and Konstadt, 1963) was used as the measure of field dependence–independence. It consisted of two series of simple figures embedded in more complex designs. The first series consisted of 11 figures in which a triangle of specific dimensions was embedded (tent series). The second (house) series had 14 items with a house-shaped figure embedded. The score was the total number of figures correctly located. Only one trial was allowed per item and there was no time limit. Since the items were arranged in order of increasing difficulty, testing was discontinued after five consecutive failures. Prior to administration of the test items, there was a demonstration of the embedding process and two practice items were given. This procedure is outlined in detail in the test manual (Karp and Konstadt, 1963).

Automatization. One measure of automatization was the Naming Repeated Animals Test developed by the first author on the rationale of the Naming Repeated Objects Test (Broverman *et al.*, 1966). It consisted of 70 one-inch line drawings of five common animals in random order. Animals included a pig, a camel, an elephant, a bird, and a dog. Animals were selected since they are so common in children's stories and games that it was assumed they would be easily recognized and labelled by all *S*s within the age range studied. *E* presented *S* with a practice page consisting of one picture of each animal to ensure that *S* could name all five animals. After *S* had named the animals correctly, he was presented with a whole sheet of animals and asked to name them all in order as fast as he could. A stopwatch was immediately started. Naming time was recorded.

The other measures of automatization were speed of colour naming on the three cards of the Colour Distraction Test (Santostefano and Paley, 1964) which consisted of 10 × 15 in. cards with pictures of lettuce, bananas, apples, and grapes in random order, 50 per card. Card I contained pictures of red apples, green lettuce, blue grapes, and yellow bananas. Once it was established that *S* knew the colour names, he was merely required to name all the colours on the card, in order, as fast as possible. Card II consisted of the same stimuli in the same order and colour with the addition of 50 black and white peripheral pictures of familiar objects, meant to be distracting. *S* was instructed to name the colours and ignore the black and white pictures. Card III was made up of the same stimuli in the same order, but all were in a contradictory colour. Bananas were either blue, red, or green, but not yellow, and so on. *S* was instructed to name the colour that should be there, rather than the one which appeared. Speed of colour naming was recorded for all three cards.

Constricted–flexible control. The measures of constricted–flexible control were also derived from the Colour Distraction Test. These were a distractibility score, an interference score, and a score based on the types of errors on the contradictory colour card. It was assumed that speed of colour naming would decrease as intrusive information was introduced and that *S*s who were more disrupted by the contradictory and distracting cues would slow down more than children who were less confused by the additional stimuli. Therefore, a distractibility score was derived from the difference between initial speed of colour naming and colour naming with distractions. Similarly, the interference score consisted of the difference between speed of colour naming and colour naming in the face of contradictory cues. In addition, three types of errors were scored: (1) errors of omission, (2) partial errors of commission (*S* began to name an incorrect colour or fruit, but stopped himself before the entire word was out, such as "green" when the correct responses was "red"), (3) complete errors of commission (*S* said "green" or "apple" when the response should have been "red").

Intelligence. The Wechsler Intelligence Scale for Children (Wechsler, 1949) was administered according to standard instructions.

Results

Means and standard deviations of the cognitive style measures are summarized in Tables 1 and 2.

TABLE 1. HYPERACTIVE-CONTROL COMPARISONS OF COGNITIVE STYLE

Measure	Hyperactive	Control
Reflection-Impulsivity ($N = 19$)		
Matching familiar figures		
$\bar{X}$ *RT* in secs.	7·7	13·2
SD	4·1	10·6
$\bar{X}$ No. errors	21·6	16·0
SD	6·4	7·0
Field Dependence ($N = 19$)		
Children's embedded figures		
$\bar{X}$ No. correct	8·9	11·1
SD	5·5	5·2
Constricted control ($N = 16$)		
Colour distraction		
$\bar{X}$ Distractibility	7·3	3·8
SD	23·6	9·0
$\bar{X}$ Interference	70·1	48·8
SD	29·1	13·2
$\bar{X}$ No. errors commission	5·9	4·1
SD	4·8	2·3

Note. Means and standard deviations of raw score data.

TABLE 2. HYPERACTIVE-CONTROL COMPARISONS OF COGNITIVE STYLE

Measure	Hyperactive	Control
Automatization		
Naming animals ($N = 19$)		
$\bar{X}$ naming time in sec	96·5	82·0
SD	38·4	26·4
Colour distraction ($N = 16$)		
$\bar{X}$ naming time in sec		
Card I	63·7	48·5
SD	22·9	11·9
Card II	70·9	52·4
SD	33·4	16·8
Card III	126·5	97·4
SD	60·6	20·1

Note. Means and standard deviations of raw score data.

Reflection–impulsivity. The Matching Familiar Figures Test yields two scores, a mean reaction time and an error score. Since reaction time scores were not normally distributed, they were converted to logarithms. Data were analysed using a *t*-test for matched groups. As expected, hyperactive *S*s were more impulsive than normal *S*s on both measures. They had significantly shorter latencies ($t = 2{\cdot}95$, $df = 18$, $p < 0{\cdot}01$) and made significantly more errors ($t = 3{\cdot}51$, $df = 18$, $p < 0{\cdot}01$).

In addition, a method developed by Kagan (1965b) was used to classify children in both the hyperactive and normal groups as either reflective or impulsive. Children are classed as reflective if they are above the median in reaction time and below the median in number of errors and as impulsive if they have latencies below the median and error scores above the median. When scores of the combined hyperactive and normal *S*s were split at the overall medians, 15 *S*s were clearly reflective and 15 were impulsive. A chi square analysis (using Yates' correction for continuity) indicated that there was a significant association between group membership and reflective or impulsive style ($\chi^2 = 6{\cdot}56$, $df = 1$, $p < 0{\cdot}02$). Hyperactive *S*s were predominantly impulsive and control *S*s predominantly reflective.

Field dependence–independence. Scores on the Children's Embedded Figures Test were analysed using a *t*-test for correlated samples. Hyperactive children, as expected, isolated fewer embedded figures than control children, although this difference was significant only when a one-tailed test was used ($t = 1{\cdot}98$, $df = 18$, $p < 0{\cdot}05$).

Automatization. Time scores were transformed to logarithms. Three hyperactive children did not complete the Colour Distraction Test. Two refused and one failed to meet the criterion of naming all the colours without hesitation on the practice strip. Thus, all analyses of this test were carried out on 16 hyperactive *S*s and their control *S*s.

(a) *Speed of naming repeated animals.* The groups did not differ significantly on this measure ($t = 0{\cdot}70$, $df = 18$).

(b) *Speed of colour naming.* A two-way analysis of variance with repeated measures across cards and paired *S*s was run. Hyperactive *S*s took significantly longer to name the colours on all three cards ($F = 13{\cdot}50$, $df = 1/15$, $p < 0{\cdot}01$.

Constricted–flexible control.

(a) *Distractibility score.* The difference between colour naming speed on card I and colour naming with distractions (card II) was determined for each *S*. Hyperactive and control groups did not difier significantly on this measure ($t = 0{\cdot}91$, $df = 15$).

(b) *Interference score.* Speed of colour naming on card I was substracted from speed of colour naming on the contradictory colour card (card III). The difference between hyperactive and control *S*s was not significant ($t = 0{\cdot}03$, $df = 15$).

(c) *Types of errors* (*contradictory colour card*). Errors were scored as errors of omission, partial commission, or complete commission as described above. Scores were transformed to log $(x + 1)$ since they were not normally distributed. Although total number of errors of commission did not differentiate the groups ($F < 1$, $df = 1/30$), there was a significant interaction between subject group and type of error ($F = 8{\cdot}65$, $df = 1/30$, $p < 0{\cdot}01$). Hyperactive *S*s made more complete errors of commission than control *S*s, whereas control *S*s made more partial errors than hyperactive *S*s. There was no difference in number of errors of omission ($t < 1$, $df = 15$).

STUDY II—DRUG EFFECTS

Method

Subjects. Twenty-two hyperactive children participated in this study, 20 boys and 2 girls. Eighteen *S*s were the same as those in study I. One boy from study I dropped out prior to completion of the drug study and 4 additional hyperactive boys were included. They had been selected and tested initially for inclusion in study I, but were dropped from the data analysis when adequate matched control *S*s could not be found. The ages ranged from 5 yr 9 months to 13 yr 4 months with a mean of 8 yr 5 months. I.Q.s ranged from 80 to 128 with a mean of 99·0.

Drug procedure. Each subject served as his own control in a double-blind drug placebo design. Order of drug administration was randomized. Eleven *S*s were seen on drug first and 11 on placebo first. The drug code was not broken until all *S*s had been tested twice on drug, so that *E* did not know when each *S* was on drug and when on placebo.

After conclusion of the pre-testing (study I) *S*s received either drug or placebo from the Drug Clinic of the Montreal Children's Hospital. Drug and placebo were in pill form and looked identical. Drug dosage was regulated by the psychiatrist on the study (G.M.) and was gradually increased from 5 mg twice a day to 10 mg twice a day, until an optimal dosage was reached. Maximum dosage was 50 mg twice a day. If drug dosage was too high as indicated by side effects, it was gradually decreased until the parents and psychiatrist agreed that the most effective dosage level had been reached. A 2-week period was allowed for regulation and stabilization of the drug. This method of gradual increase in drug dosage was used for both drug and placebo. After the first drug test, new pills were obtained from the drug clinic and a further 2-week period of drug regulation preceded the second drug test.

Dosage at the time of testing ranged from 5 mg b.i.d. to 50 mg b.i.d. with a mean of 30 mg b.i.d.

Test administration. The four cognitive style tests were administered three times under pretest (study 1), drug, and placebo conditions. Test administration followed the same procedure as in the previous study, except that the WISC was not administered.

Results

Means and standard deviations for the pre-test, drug, and placebo conditions are summarized in Tables 3 and 4. Scores were transformed as in the previous study.

Reflection–impulsivity. Matching Familiar Figure reaction time and error scores were analysed using a two-way analysis of variance with repeated measures. Order of drug administration was included as an additional variable in these analyses. The difference between drug and placebo conditions was significant with error scores decreasing ($F = 8{\cdot}75$, $df = 1/20$, $p < 0{\cdot}01$) and reaction time increasing ($F = 11{\cdot}94$, $df = 1/120$, $p < 0{\cdot}01$) when the *S*s were on the drug. Thus, the data indicate that hyperactive children became significantly less impulsive while on methylphenidate.

Field dependence-independence. Scores on the Children's Embedded Figures Test were not significantly affected by the drug ($F < 1$, $df = 1/20$).

TABLE 3. DRUG EFFECTS ON COGNITIVE STYLE

Measure	Pretest	Drug	Placebo
Reflection-impulsivity ($N = 22$)			
Matching familiar figures			
$\overline{X}$ *RT* in sec	8·1	16·7	8·0
SD	4·3	24·4	4·7
$\overline{X}$ No. errors	20·7	15·1	18·4
SD	6·9	6·2	8·9
Field dependence ($N = 22$)			
Children's embedded figures			
$\overline{X}$ No. correct	8·9	14·4	13·5
SD	5·1	6·1	5·4
Constricted control ($N = 18$)			
Colour distraction			
$\overline{X}$ Distractibility	2·4	5·4	2·5
SD	17·8	10·5	14·8
$\overline{X}$ Interference	51·8	24·0	29·7
SD	60·4	26·7	36·7
$\overline{X}$ No. errors commission	5·3	21·6	4·6
SD	3·9	3·3	2·5

Note. Means and standard deviations of raw score data.

TABLE 4. DRUG EFFECTS ON COGNITIVE STYLE

Measure	Pretest	Drug	Placebo
Automatization			
Naming animals ($N = 22$)			
$\overline{X}$ naming time in sec	94·3	79·6	88·5
SD	38·4	31·6	33·0
Colour distraction ($N = 18$)			
$\overline{X}$ naming time in sec			
Card I	62·7	54·9	60·2
SD	66·6	57·8	67·9
Card II	65·7	60·4	62·7
SD	71·2	65·2	69·2
Card III	114·4	78·6	84·9
SD	124·1	84·4	97·6

Note. Means and standard deviations of raw score data.

Automatization.

(a) *Speed of naming repeated animals.* Naming time did not change significantly with drug administration ($F = 4{\cdot}00$, $df = 1/20$).

(b) *Speed of colour naming.* Only 18 *S*s are included in this analysis since 4 *S*s did not complete this test on all test sessions. A three-way analysis of variance with repeated measures across drug conditions and cards was used to analyse these data. The effect of the drug was not significant ($F = 1{\cdot}13$, $df = 1/16$).

Constricted–flexible control.

(a) *Distractibility score.* There was no change on drug ($F < 1$, $df = 1/16$).

(b) *Interference score.* Interference effects were not altered by drug administration ($F < 1$, $df = 1/16$).

(c) *Types of errors (contradictory colour card).* The drug significantly decreased errors of complete and partial commission on the contradictory colour card ($F = 7{\cdot}00$, $df = 1/16, p < 0{\cdot}05$). Errors of omission did not show a significant drug effect ($F = 2{\cdot}31$, $df = 1/16$).

DISCUSSION

The results clearly indicate that hyperactive children approach cognitive tasks differently from normal children. When required to select from several alternative responses, the hyperactive child is more likely to respond impulsively without evaluating the response possibilities. Moreover, when faced with alternative and contradictory cues, he is less apt to monitor his behaviour and inhibit incorrect responses. On a task demanding the isolation of a relevant stimulus from a confusing background, he tends to be more easily drawn by the most obvious and compelling aspects of the stimulus field. Finally, when the task requires rapid response rates, he is slower than the normal child, suggesting poor ability to concentrate. Taken together these data suggest that hyperactive children typically employ less efficient problem solving strategies than normal children.

It is worth considering the possibility that the impulsive, field dependent approach that hyperactive children tend to employ may be sufficient to explain their school difficulties without recourse to notions of specific cognitive deficit. The child who is unable to monitor his response output and who tends to respond rapidly, without concern about accuracy, will not meet the school's demands behaviourally or academically. Such a child would be expected to hand in disorganized and messy written assignments, to make careless reading errors, and to be generally haphazard in his approach to academic work regardless of his actual ability to deal intellectually with the task at hand. Moreover, the child who has difficulty maintaining rapid response rates on measures of automatization would be expected to concentrate less well on tasks which require rote memory.

If, in fact, the hyperactive child's inefficient cognitive styles do contribute to his difficulties, modification of these styles would appear to be a major therapeutic goal. There is some evidence to suggest that behavioural techniques can be used to improve the ability of hyperactive (Palkes, Stewart and Kahana, 1968) and normal children (Kagan, Pearson and Welch, 1966a) to delay responding until they have examined response alternatives. The present data indicate that methylphenidate similarly modifies the cognitive behaviour of hyperactive children and results in more efficient, careful problem solving. Hyperactive children became significantly more reflective and made fewer errors of commission while on the drug. Thus, they were able to inhibit incorrect responses on several measures and delay responding sufficiently to consider all possible responses. These data suggest that improvements in school achievement, classroom behaviour, and specific cognitive abilities after administration of methylphenidate may all result from a general increase in attention, response organization, and impulse control.

SUMMARY

Hyperactive and matched normal children were compared on four dimensions of cognitive style: reflection–impulsivity, field dependence–independence, constricted–flexible control, and automatization. The hyperactive group was more impulsive, more field dependent, more constricted in ability to control attention, and slower on measures of automatization than the control group. When the effect of methylphenidate on the cognitive styles of hyperactive children was examined, using a double blind, own control design, the drug resulted in less impulsive responding and improved ability to inhibit incorrect responses.

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BOOK REVIEWS

Child and Adolescent Psychology: Behaviour and Development. G. R. MEDINNUS and R. C. JOHNSON. Wiley, New York, 1969, pp. 787. £4.40.

Children and Adolescents: A Biocultural Approach to Psychological Development. T. ALEXANDER. Atheron, New York. No price stated.

THESE are both substantial, particularly the work of Medinnus and Johnson, which is indeed an extension of the second edition of *Child Psychology: Behavior and Development.* Including author and subject index, the book runs to 787 pages, and is divided into sections on basic factors in development (heredity, growth and maturation, learning and motivation, language and intelligence), family influences, social influences (the actual heading carries the hideous title: "Societal Influences on Socialization"), the emergence of the self, and adolescence. The book follows a developmental approach, and is simply written with very good documentation in each section, providing an excellent summary of existing facts. The principal weakness is a naivety in underlying thought, which is particularly evident in the introduction to the book and in the opening chapter ("Scientific Method and Child Psychology"). It is claimed for example that by simply using the scientific approach developmental psychology can ultimately be brought to the same level of accuracy and prediction as physics, and the authors dismiss any possibility of obtaining knowledge by other methods with a disdain which gives an uneasy impression of arrogance and intolerance. Confidence in the maturity of the authors' judgement is not improved by such unqualified remarks as "most scientists . . . are unconcerned with practical utility. For them, knowledge is an end in itself" and "(the concept of) control does not mean forcing the individual to act in a desired manner. It means rather increasing the frequency of certain behaviours and decreasing the frequency of other behaviours through manipulation of the environment" (p. 11)—like the distinction between "war" and "armed conflict".

Throughout all sections of the book one finds a similar treatment: the work consists of an admirable summary of research with relatively little critical analysis or reflection on the facts. Thus in spite of the painstaking documentation, the work tends to give an impression of superficiality. There is a reasonable balance of factual material, but only 13 per cent of the actual space is given to adolescence, which is discussed without reference to the concept of developmental guidance and counselling, vital in any consideration of adolescence as a whole. Also surely the concept of creativity should be allowed more than three-and-a-half pages in such a long book?

Dr. Alexander's book covers the same age period but the presentation is in several respects different. Starting with the assumption that all approaches to human development can basically be classified as biological or cultural, he develops this theme in an opening chapter, and follows with a study of general physiological and psychological aspects of development in infancy. The physiological emphasis continues in Chapter 3, which makes a survey of bodily systems directly related to behaviour (such as the endocrine system, the reproductive system, and the nervous system) and indirectly related (such as the gastro-intestinal system), and then goes on to show how these are integrated with environmental influences. Chapters 4 to 6 inclusive deal with behavioural development in early and middle childhood, separated by a chapter on motivation and cognitive development. Chapter 7 makes a detailed and careful examination of intellectual development, followed by a complete chapter on creativity—in contrast with the mere three-and-a-half pages given to this in Medinnus and Johnson's much larger book. As might be expected, the discussion here is more than a mere summary of evidence, and considers the validity of various efforts to define creativity, as well as the intricate relationship between creative and logical thought in everyday life. Following a chapter on socialization, Alexander gives one chapter to adolescence, which, in contrast to the preceding sections, is rather disappointing. There is for example almost no consideration of adolescence in societies other than the American. Indeed, I preferred the treatment of adolescence in Medinnus and Johnson, although in both books the space devoted to the subject is too scanty, and as in Medinnus there is no discussion of counselling.

To some degree Alexander compensates for his cursory treatment of adolescence in the last four chapters of his book. Chapter 11 considers the important current question of the child and the adolescent in their relationships with authority, Chapter 12 their wider relationships with society, and Chapter 13 is given to developmental disorders. The last chapter of the book ("Methods and Theories in Child and Adolescent Psychology") is one of the most useful, and might have been better placed at the start. It is in many ways a corrective to the similar treatment in Medinnus and Johnson. Although Alexander is committed to the advantages of scientific method, the tone lacks the rather hysterical assertions of the other authors, and considers in a more detached and mature way the claims and methods of behavioural science. These are ordered under the headings of symbolization, description, explanation, and theorization, and there is a useful if necessarily brief review of a number of different research approaches, and techniques. He closes his work by pointing out that there is no universal agreement among scientists about the single best approach to human behaviour, and that both clinical and experimental methods may be separate roads to knowledge.

TREFOR VAUGHAN

Violence Against Children. Physical Child Abuse in the U.S.A. DAVID G. GILL. Harvard University Press, Cambridge, Mass. 1970, pp. x + 204, $6.50.

READERS of the Journal may recall a chapter by this author in the recent and excellent book on *The Battered Child* by Helfer and Kempe. The present book enlarges and completes that contribution. It deals with a series of nationwide epidemiological studies of child abuse in the U.S.A., extending from 1965 to 1968. These include a survey of public knowledge and opinion on child abuse, a press survey, a pilot survey of child abuse in California, and, as the principal feature, a national survey of child abuse reported through legal channels in 1967–8. The definitions used are of course very important in assessing the scope of the work: there must have been intentional use of force or intentional acts of omission by the parent or caretaker, aimed at hurting, injuring or destroying the child; the age limit is not set, so that 5 or 6 per cent of the children are over 15; and the definition includes some cases of deliberate malnutrition, and sexual molestation. Clearly the insistence on such words as "intentional" and "aimed at" implies an assessment of motivation, which must be a great hazard in research, and, in a subject so fraught with feeling as this, must introduce a very large margin of error. However, it is a start in a field which is certainly barren of facts, and the results are very interesting.

Physical abuse of children does not seem to be a "major killer" of children as the popular press had once claimed. "If, then, the 6000 to 7000 incidents that are reported annually through official channels are, as a group, an approximate representation of the severe segment of the nationwide abuse spectrum, then the physical consequences of child abuse do not seem to be very serious in the aggregate . . . the classical 'battered child syndrome' was found to be a relatively infrequent occurrence." Physical abuse is seen as one aspect of the life-style of poverty and the ghetto. The family structure was extensively studied and "high rates of deviance in areas of bio-psycho-social functioning" both of the children and perpetrators were found. Eighty-seven per cent of perpetrators are parents or parent substitutes, but the involvement rate is higher for fathers and stepfathers than for mothers. The well-known tendency to repetition of assaults upon one or successive children is confirmed. An analysis of the precipitating circumstances of the incidents is made.

Finally recommendations are offered for the prevention of these abuses. They centre round two principles; the gradual elimination of violence from the child-rearing philosophy and practice, and measures to reduce poverty.

P. D. SCOTT

Child Life and Health. Edited by Ross G. Mitchell. 5th Edn. J. and A. Churchill, London, 1970, pp. xvi + 586. £6.00.

This is the fifth edition of the book previously edited by Professor R. W. B. Ellis, and then called *Child Health and Development.* Its authorship remains largely Scottish. The new title has been chosen to indicate the increasing emphasis on social aspects of child life. The book should perhaps now be subtitled "The biological, psychological and social basis of paediatrics", for that is, in effect, what it provides.

It is divided into two parts. Part I has eleven chapters on child development, covering genetics, prenatal development, the newborn, feeding, growth, puberty, behavioural, intellectual and emotional development, and immunization. All the chapters are detailed, authoritative and comprehensive; taken together they must provide one of the best and most straightforward accounts available of growth and development, which are traditionally and rightly regarded as the basic sciences of paediatrics. Each of the chapters is good enough to deserve particular mention; invidiously one must pick a very few. Professor Jim Tanner's account of postnatal growth, and its partner chapter on puberty, bring together the results of all his studies on these subjects in a uniquely informative and valuable way. Child psychiatrists will want to judge Dr. Fred Stone's short, eclectic account of emotional development for themselves, but to a paediatrician it seemed particularly perceptive. Professor Ross Mitchell, on Nutrition and Feeding, shows how well and interestingly it is possible to write about an important but hackneyed subject.

Good though Part I is, it is Part II—on child care and social paediatrics—which transforms this from a very good sound textbook into a work of exceptional value and interest to the training—or trained—paediatrician or child psychiatrist. One of the great debates within paediatrics today is whether it should continue basically along its familiar lines, concerned mainly with "sick" children, and drawing its new ideas and inspiration from the advances in pathophysiology and biochemistry, or whether it is to be an altogether more outward-looking discipline, concerned with child health in the community and with the provision of services to those children who need them, whether or not they are referred to the paediatrician in hospital. (Of course this is a greatly simplified expression of the issues involved, putting both points of view in an extreme form. But there is no doubt as to the reality of the debate.) The 13 chapters in Part II discuss the wider concerns and interests of paediatrics —social influences; the infant, school health, and social services; education and vocational guidance; mental health; "children in trouble"; and finally, as a reminder that our concerns should not end at home, child health in the tropics. They offer more than just an enlightened attitude to paediatrics; they are also packed with useful information about legislation and available services. Choosing one chapter again for special mention, one would like everyone concerned with the care of children to read Drs. A. J. Wootton and R. Illsley on "Social influences on children and their parents". The staggering figures on the social class incidence of mild mental retardation (I.Q. 50–70)—0·4 per thousand in the non-manual classes, but 22·1 per thousand in the semi-skilled and unskilled classes—have been published before. What is added here is a highly perceptive account of what is actually known of the differences between the classes in the way they talk to and bring up their children.

There is almost indecently little that one can criticize about this book, but perhaps the next edition will give a whole chapter to the problems of immigrant children, and will make a few more concessions in Chapter I (on genetics) to the "junior student" to whom the book is partly aimed—though we all know that Scottish students are made of tough stuff.

It has become customary for reviewers to end with a grumble about the price. £6 may sound a lot for a book, but at less than 1p per page this one is exceptional value. It is almost indispensable for paediatricians and child psychiatrists in training, and there are few consultants in either speciality who would not be better off for reading and owning a copy.

Roger Robinson

The Emotionally Disturbed Child. A Parent's Guide. For Parents Who Have Problem Children. Harold D. Love. Charles C. Thomas, Springfield, Illinois, 1970, pp. xiii + 105. No price stated.

In his preface the author states that this book should be useful to parents, physicians, psychologists, ministers, guidance counsellors, psychiatrists and teachers. "It should also be reading material for any person who intends to be a parent at some time in his life." The aim of helping parents to learn more about emotional disturbance and mental illness in children is a praiseworthy one, but the author might have had greater success with more limited objectives.

Chapter headings in the book deal in succession with such subjects as abnormal behaviour from the parent's viewpoint, factors affecting the child's personality, personality disorders, signs of approaching mental illness in children, treatment for mental illness, private and public mental facilities for children, admissions and relapses and so on. The quality of writing is uneven. Some sections, which include fears and popular misconceptions about mental illness, activities in a mental hospital and the importance of both work and play for children, are expressed clearly. Much information is provided, but not everyone would agree with statements such as (on page 15) "The senile period is usually considered to be from forty to sixty-five years".

On first reading this book, I wondered whether the impression it produced might be connected with differences between the British and North American cultures. However, recollecting that recently I had read with delight another book in which an American author dealt with relationships between parents and children, I came to the conclusion that Dr. Love unfortunately presented information in a manner which probably did not achieve the result he wanted. Thus on page 12 the reader is told: "Parents should realize if their children see them overrespond to minor ailments and frustrations, insulate themselves from emotions, or displace hostilities constantly on to others, that they cannot be well adjusted as adults any more than can the child of a known kleptomaniac or convicted murderer. Parents are the key to the healthy emotional success of their children." This may be true, but the manner in which it is expressed is likely to stimulate feelings of guilt in the parent without giving him any clear idea about how to improve.

On page 37 the author declares: "The beginning of adolescence is naturally a stormy period and the parent should expect no picnic. . . . In short, one must expect many problems at this stage, but the alarming ones may be gross inability to make friends, excessive eating or starving, inability to make decisions, and unwillingness to grow up." In view of the research carried out by Rosenthal regarding the effect of teacher expectations on the behaviour of children, this description of adolescence seems particularly unfortunate and could perhaps function as a self-fulfilling prophecy.

There is certainly a disparity between the author's stated aim and the impression the book conveys. A parent who was mildly concerned about his child when he began to read this book might well feel extremely anxious by the time he finished it.

M. MacNamara

Academic Child Psychiatry. Edited by P. Adams, K. Work and J. Cramer. The Society of Professors of Child Psychiatry, U.S.A., 1970, pp. 1–150. No price stated.

To a child psychiatrist working in the United Kingdom where the idea of even a single academic department in his subject is still but a gleam in some university administrator's eye, there is something wickedly extravagant about the notion of a whole Society of Professors of Child Psychiatry. Yet such a society exists in the United States, having been formed after a group of medical educators in the subject had met in Florida in 1969. This brief volume is a report of the discussions which took place at that meeting.

It is significant that pride of place in this volume should be given to two contributions (those by Joseph Cramer and George Gardner) which deal very little with research and teaching, but concentrate instead on the present scope of clinical services in the United States and on the implications of different types of community mental health centres for the future of child psychiatry. The point is made that a national training programme must take into account the role which the trained doctor is to fulfil.

Yet, as Salvador Minuchin points out in a brief but excellent discussion of Gardner's paper, it is not sensible to train child psychiatrists to carry out traditional procedures without exploring the most pertinent question: How effective is our current delivery of services? Minuchin, in his critique, points to the need to understand the child's behaviour in relation to a variety of settings; family, school, etc. and to broaden the diagnostic approach to include the possibility of meaningful change in the environment as well as change in the intra-psychic life of the child. Whatever the approach, the need for continual monitoring and evaluation is stressed.

Later in the book Albert Solnit describes the Yale scheme of undergraduate teaching in social paediatrics whereby a student is attached as an auxiliary health visitor to serve and thus to understand the medical and social needs of a deprived family in the local community. Paul Adams expounds the merits of the psychologist and the social worker as teachers in the medical school and in psychiatric training. James Anthony makes a witty and persuasive plea for more research opportunities in the training of child psychiatrists and suggests various ways in which training programmes can be modified to include conduct of a research project.

As this review must already have indicated, the present volume contains little or nothing on the content of research or even on the content of training programmes. It is about the administration of academic departments, and as such it is likely to be of interest only to those involved in teaching and research organization. Hopefully, this is an expanding audience, but, as many of the contributors to this book point out, expansion can only occur if research findings provide a more scientific basis for future clinical services.

PHILIP GRAHAM

The Young Adolescent, Clinical Studies. PETER BLOS. The Free Press, New York and Collier-MacMillan, London, 1970, pp. x + 252. No price stated.

THIS book makes a significant contribution to the understanding of the early part of adolescence. The author describes the two guide lines, clinical observation, and the developmental point of view. The author stresses the sequential order of psychological development; the orderly, stage-by-stage unfolding is described in the language of Freudian psychology. One of the values of this book is the constantly demonstrated interrelationship between theory, clinical observation and therapeutic manoeuvre. The complexity of human psychological development needs no emphasis and the vicissitudes of adolescence are hardly to be understood, without recourse to a coherent body of theory.

The book deals with two patients, a boy Ben, and a girl Susan, and this contrast is very helpful in showing the reader the differences in psychosexual development between the age of 10–14 or so. The author is at one with many authoritative writers in saying that identify formation is one of the major tasks of the adolescent period.

The theoretical formulations throughout are carefully and accurately set down. Some are classic in the accuracy and economy of the expression; there is an exceptionally interesting chapter on transference and resistance.

The final chapter in the book on the reciprocal impasse of the parents and their adolescent child makes refreshing reading, with its comments on the generation gap and its understanding of the parental viewpoint. As the author writes:

"The present epoch has cast—chiefly by way of the advertising media—a cloud of doom on aging, with the result that the parent needs the child more urgently and for much longer than before in order to remain young."

Thus although one of the features of adolescence is the increasing emotional disengagement of the young person from the parent, therapeutic work cannot be concentrated solely on the adolescents themselves.

Experience shows that helping parents in the resolution of these prolonged entanglements is no easy task.

At a time when both the theory and practice of psychoanalysis is still under attack, this book may seem to have a limited appeal. And few psychiatrists have the clinical time or the training to make the clinical observations on which the scientific basis of the theory rests. Yet the problem of understanding the disturbances of adolescence and of devising proper and effective methods of treatment is becoming an increasingly important task of contemporary psychiatry. Little significant advance will come until we can progress beyond the pragmatic environmental manipulation and the use of drugs. Peter Blos's book makes a definite step in the right direction.

W. H. Allchin

J. Child Psychol. Psychiat., Vol. 12, 1971, p. 75. Pergamon Press. Printed in Great Britain.

ANNOUNCEMENTS

UNION OF EUROPEAN PEDOPSYCHIATRISTS
IVTH CONGRESS 30 AUGUST–3 SEPTEMBER 1971

THE Union of European Pedopsychiatrists will hold its IVth Congress in Stockholm, August 30–September 3, 1971. The prime objective of this congress is to promote exchange of experiences related to depressive states in children and adolescents. The Organizing Committee welcomes everyone who works in this field—psychiatrists for children and adolescents and qualified members in allied professions and their family members.

Enquiries to:
IV U.E.P. Congress
c/o RESO Congress Service
S–10524 Stockholm
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NEW YORK STATE PSYCHIATRIC INSTITUTE
75TH ANNIVERSARY SYMPOSIUM 21–23 NOVEMBER 1971

THE New York State Psychiatric Institute, the world's first multidisciplinary institute established for the purpose of research in psychiatry, will celebrate its 75th anniversary on November 21–23, 1971. A symposium program on the theme, "*Seventy-five Years of Progress in Psychiatric Research and Teaching*" is planned. Professor Lopez-Ibor, Dr. Ewald Busse, Dr. Edward Stainbrook, Dr. Denis Leigh and numerous others have already agreed to speak at the symposia.

behavioural screening, questionnaire,
three-year-old children

ICHMAN, N. and GRAHAM, P. J. (1971) A behavioural screening questionnaire for use ith three-year-old children. Preliminary findings. *J. Child Psychol. Psychiat.* **12**, 5–33.

ummary—The development of a *questionnaire* to be completed by parents for use in creening *preschool children* is described.

Ninety per cent of children attending a psychiatric clinic were identified when the riteria were a score of 11 or more points on the behaviour scale and/or inability to speak n 3-word phrases, and/or speech which was very difficult to understand.

The questionnaire could be used as a basis for collecting information systematically bout preschool children, and as a screening device for identifying children with *ehaviour difficulties* and *developmental delay.*

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refractory behaviour, normal adolescent males,
relation to psychopathy, early experiences

AVIES, JOHN G. V. and MALIPHANT, RODNEY (1971) Refractory behaviour at school in ormal adolescent males in relation to psychopathy and early experience. *J. Child sychol. Psychiat.* **12**, 35–41.

ummary—Two studies of refractory behaviour in school of adolescent boys are eported. A close association between scores on the Psychopathic Deviant Scale (Pd) of he Minnesota Multiphasic Personality Scale (M.M.P.I.) and teachers' assessments of efractory behaviour suggest that such behaviour could be considered as being on the ame continuum as psychopathy and that the Pd Scale might prove a useful index of it. arly adverse experience was also found to be related to refractory behaviour, as in sychopathy.

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diagnosis, reliability study, childhood and
adolescence

FREEMAN, M. (1971) A reliability study of psychiatric diagnosis in childhood an adolescence. *J. Child Psychol. Psychiat.* **12**, 43–54.

Summary—The reliability study on the G.A.P. classification by 20 psychiatrists h demonstrated a high interindividual and intraindividual consistency. This diagnost consistency is equal to the findings of any high agreement study in adult psychiatry an comparable with diagnostic error reported in other medical specialities. Garland (195 proposed that all forms of clinical practice have a measurable degree of diagnostic err and if all branches of medicine could be tested this phenomenon would probably quite universal. The New South Wales study on the G.A.P. classification has confirme that child psychiatry is no exception to this rule.

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cognitive styles, hyperactive children, effect of
methylphenidate

CAMPBELL, SUSAN P., DOUGLAS, VIRGINIA I. and MORGENSTERN, G. (1971) Cogniti styles in hyperactive children and the effect of methylphenidate. *J. Child Psychol. Psychi* **12**, 55–67.

Summary—Hyperactive and matched normal children were compared on fo dimensions of cognitive style: reflection–impulsivity, field dependence–independen constricted–flexible control, and automatization. The hyperactive group was mo impulsive, more field dependent, more constricted in ability to control attention, a slower on measures of automatization than the control group. When the effect methylphenidate on the cognitive styles of hyperactive children was examined, using double blind, own control design, the drug resulted in less impulsive responding a improved ability to inhibit incorrect responses.

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J. Child Psychol. Psychiat., Vol. 12, 1971, pp. 77 to 90. Pergamon Press. Printed in Great Britain.

EMOTIONAL SENSITIVITY AND INTELLIGENCE IN CHILDREN FROM ORPHANAGES AND NORMAL HOMES

WILLIAM M. CHEYNE and GUSTAV JAHODA

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THERE HAVE been numerous studies concerned with the communication of emotional meaning among adults which have been reviewed by Kramer (1963), but until recently very little work has been done with children since the early studies of Gates on facial expression (1923) and vocal expression (1927). Dimitrovsky (1964) followed up the Gates (1927) study as part of extended series of investigations of the perception of emotional meaning, or "emotional sensitivity" which is the term used by these and also by the present investigators. She had children from 5 to 12 yr old identify emotions in voices by pairing them with appropriate drawings. Perception of negative emotions (anger and sadness) was more accurate than perception of positive emotions (happiness and love) and the recognition of these emotions varied with age and sex of subjects, and sex of speakers. One of her findings was that children tended to attribute negative rather than positive emotions to voices to such an extent that the relative superiority in recognizing emotions could be explicable on the basis of this response bias. The present study is concerned with the extent to which such a response bias could be related to differences in everyday experience. For this reason, a group of children brought up in an orphanage, who may be presumed to have different and probably more negative emotional experiences, are compared for emotional sensitivity with a matched group of children from normal homes.

Another important finding of Dimitrovsky (1964) was that there was a positive correlation between verbal ability and emotional sensitivity significant only for the youngest children. With adult subjects, Davitz (1964) found low positive correlations between emotional sensitivity and both verbal and non-verbal intelligence, and concluded that a minimum amount of intellectual ability is necessary but not sufficient for recognition of emotional meaning from vocal cues only. A similar conclusion was reached by Forrai-Banlaki (1965) in a Russian study of recognition of emotion from facial expressions in portraits, by children between 7 and 9 yr old. Disadvantaged children have been shown to have a deficiency in verbal and non-verbal ability that varies with age (Whiteman and Deutsch, 1968), and orphanage children have been shown to be relatively deficient in a wide range of intellectual and other abilities (Yarrow, 1964). It is therefore possible that orphanage children could also show a deficiency in emotional sensitivity for this reason.

Intelligibility of speech has been shown to vary with the relationship between speech of speakers and listeners (Eisenberg *et al.*, 1968) and it is likely that emotional

Accepted manuscript received 29 *March* 1971

sensitivity could be affected in a similar fashion. For this reason both educated and uneducated Scottish voices are used in the present study.

This study is thus concerned with the following issues. Are orphanage children handicapped in the recognition of emotion in voices compared with children with normal homes when intelligence and social class are controlled? In attributing emotion to voices, do orphanage children show different response biases in keeping with their different known circumstances and past experiences? Do differences between educated and uneducated speech affect the recognition of emotional meaning from vocal cues?

METHOD

The method used follows closely that used by Dimitrovsky (1964).

Materials

A number of male and female drama students recorded the passage,

"I am going out now. If anyone calls, just tell them I am not at home",

with intonations intended to convey Anger (A), Happiness (H), Sadness (S) or Love (L). Each speaker was recorded once with a standard educated Scots voice and once with an uneducated Glaswegian dialect. A random order of 80 such recordings was presented to a first-year psychology class who rated the portrayed emotions as A, H, L, S or Other. On the basis of these ratings, 16 recordings were chosen according to three variables: Emotion (A, H, L or S), sex of speaker, and speech of speaker (Educated/Uneducated), with one recording for each combination of the variables. These voices had a high (mean = 83 per cent) and as far as possible equal probability of being correctly identified by a significant majority of 97 Scottish-born student judges. The percentages of judges who correctly identified each of the 16 selected voices are shown in Table 1.

TABLE 1. PERCENTAGE OF JUDGES IN PILOT STUDY WHO CORRECTLY IDENTIFIED EACH VOICE

	Angry	Sad	Loving	Happy	
Male educated	87	87	60	89	81
Male uneducated	83	82	72	83	80
Female educated	82	82	89	85	85
Female uneducated	81	75	84	69	77
	88	82	76	82	

The 16 voices were arranged in 4 orders which counterbalanced the 3 variables. Each order was preceded by a recording of the same passage spoken without any specific emotional expression by a woman's, a child's and a man's voice.

A set of cards with stick drawings of a man or a woman portraying the four emotions, identical to those used by Dimitrovsky (1964, p. 72), were constructed for use as response materials. These consisted of 1 male and 1 female example representing each of A, H, and S, and two alternatives of each sex for L.

Other materials were the standard test materials for the English Picture Vocabulary Test (Brimer and Dunn, 1962) and Coloured Progressive Matrices (Raven, 1956).

Subjects

Initially, 161 children between 6 and 11 in two orphanages near Glasgow, and 100 children of the same age range in two Glasgow schools were tested. Two groups, 80 from the Orphanage (O) and 80 from normal homes (N), were selected with 8 of each sex of 6, 7, 8, 9 and 10 yr olds in each group. These were matched within each subgroup for non-verbal intelligence according to raw scores on Coloured Progressive Matrices, and as far as possible for socio-economic status according to known parental occupations. Subgroup means for matrices tended to be at or below the 25th percentile level according to Raven's (1956) norms, and the samples were predominantly children of unskilled manual workers.

Design

The experimental groups were thus arranged according to Home Background, Sex and Age into a 2 × 2 × 5 Factorial design, with 8 subjects in each cell. Each subject was tested for the effect of Sex, Speech and Emotion on perception of emotion with the 16 voices in a 2 × 2 × 4 arrangement as shown in Table 1 above.

Procedure

Each child was tested individually, in a separate room in the orphanage/school, in a single session for, (a) Vocabulary (EPVT), (b) Non-verbal intelligence (Matrices), and (c) Emotional Sensitivity. The procedures for (a) and (b) were as in the appropriate manuals (Brimer and Dunn, 1962; Raven, 1956) and that for (c) is given below.

(i) *S* was presented with the recordings for woman, child and man and required to say in each case whether it was the voice of a man, woman or child.

(ii) *S* was shown the two "Loving" pictures and chose the one in which the man/woman loved the child most. The other card was discarded.

(iii) *E* ensured that *S* could identify twice in succession the Sad, Angry, Happy and Loving man/woman in the drawings.

(iv) *S* was presented with the 8 male/female voices and picked out the drawing which corresponded to each voice.

Steps (ii) to (iv) were carried out first with one sex of speaker and then with the other. The 4 different orders of voices ensured that half the subjects had female and half had male voices first.

RESULTS

The 16 responses for each *S* were scored 1 or 0 according to whether the emotions were correctly identified or not. A complete analysis of the data would consider 3

TABLE 2. ANALYSIS OF VARIANCE OF EMOTIONAL SENSITIVITY AS A FUNCTION OF AGE (6, 7, 8, 9, 10), SEX, HOME (ORPHANAGE, NORMAL), EMOTIONS (ANGRY, SAD, HAPPY, LOVING), SEX OF SPEAKER, AND SPEECH OF SPEAKER (EDUCATED, UNEDUCATED)

Source	SS	*df*	MS	F	*p*
Between subjects					
Age (A)	91·213	4	22·803	12·347	0·001
Sex (B)	0·400	1	0·400		
Home (C)	5·625	1	5·625	3·046	n.s.
AB	12·850	4	3·213		
AC	1·438	4	0·359		
BC	3·600	1	3·600	1·949	
ABC	8·213	4	2·053		
Subjects within groups	258·563	140	1·847		
Within subjects					
Emotions (E)	252·188	3	84·063	83·895	0·001
Pos. v. Neg.	228·006	1	228·006	227·551	0·001
A v. S	23·653	1	23·653	23·606	0·001
H v. L	0·529	1	0·529		n.s.
Emotion × Age (EA)	35·312	12	2·943	2·937	0·001
Age × Pos/Neg	21·337	4	5·334	5·323	0·001
Age × A/S	4·269	4	1·067	1·065	n.s.
Age × H/L	9·706	4	2·427	2·422	0·05
EB	1·013	3	0·338		
EC	3·938	3	1·313		
EAB	15·425	12	1·285		
EAC	17·938	12	1·495		
EBC	0·588	3	0·196		
EABC	6·913	12	0·576		
E × S within groups	420·688	420	1·002		
Sex of speaker (F)	28·900	1	28.900	30·350	0·001
FA	5·788	4	1·447	1·519	
FB	3·600	1	3·600	3·781	n.s.
FC	0·025	1	0·025		
FAB	6·837	4	1·709	1·795	
FAC	10·288	4	2·572	2·701	0·05
FBC	0·100	1	0·100		
FABC	3·150	4	0·788		
F × S within groups	133·313	140	0·952		
Speech of speaker (G)	21·756	1	21·756	24·019	0·001
GA	1·338	4	0·334		
GB	0·056	1	0·056		
GC	0·506	1	0·506		
GAB	0·413	4	0·103		
GAC	1·150	4	0·288		
GBC	0·006	1	0·006		
GABC	1·963	4	0·491		
G × S within groups	126·813	140	0·906		

TABLE 2 (cont.)

Source	SS	*df*	MS	F	*p*
FG	1·806	1	1·806		
FGA	19·600	4	4·900	3·132	0·05
FGB	0·156	1	0·156		
FGC	0·306	1	0·306		
FGAB	2·563	4	0·641		
FGAC	3·163	4	0·791		
FGBC	0·006	1	0·006		
FGABC	9·338	4	2·334	1·492	
FG × S within groups	219·063	140	1·565		

variables (Age, Sex, and Home Background) involving comparisons between subjects, and 3 variables (Emotion, Sex, and Speech of speaker) involving comparisons of replications within subjects. Since variance assumptions underlying analysis of variance could not be tenable for scores limited to 0 or 1, or 0, 1 or 2, the higher order interactions which would entail analysis of such data were not considered. Only the parts of the analysis of variance concerned with between subject effects, and those within subject effects based on scores with a possible range of at least 0–4 were carried out—this means that the within subject interactions between emotion and sex or speech of speaker were not considered. The summary table for this analysis is given in Table 2. The results can be conveniently considered in terms of,

TABLE 3. MEAN NUMBERS OF CORRECTLY IDENTIFIED EMOTIONS IN EACH GROUP AT EACH AGE LEVEL (max. = 16)

Age	Orphanage		Normal homes		Mean
	M	F	M	F	
6	5·50	5·13	7·88	8·88	5·84
7	7·25	6·13	6·63	7·75	6·94
8	7·88	8·88	8·88	8·88	8·62
9	6·38	9·38	9·00	9·50	8·56
10	9·25	10·88	10·75	10·13	10·25
Mean	7·25	8·08	8·63	8·23	

(a) Total emotional sensitivity scores, (b) Comparison of different emotions, (c) Sex and speech of speakers, and (d) Emotional sensitivity and intelligence.

Total emotional sensitivity scores

The mean numbers of correct responses for subjects in each subgroup are given in Table 3, and the analysis of variance shows that the only significant effect is Age. There are no significant differences in overall sensitivity between groups with different Home backgrounds, nor between different sexes, and none of the interactions between these variables are significant. Since subjects had to choose one of the four emotions on each trial, a score of 4·0 would reflect chance level of responding. The mean of 5·84 for the 6 yr olds is significantly greater than chance ($t = 4{\cdot}52$, $p < 0{\cdot}001$).

Different emotions

There is significant variance between emotions and this interacts with age but not with any of the other subject variables (Table 1). The mean recognition scores (max. = 4·0) for Angry (A), Sad (S), Loving (L) and Happy (H) are 2·88, 2·34, 1·46, and 1·38 respectively. Orthogonal comparisons show that the positive emotions (H and L) are less easily identified than the negative ones (A and S), and that within these pairs Angry is more easily identified than Sad but there is no difference between Happy and Loving. These effects must, however, be considered in the context of their interaction with age which is represented in Fig. 1.

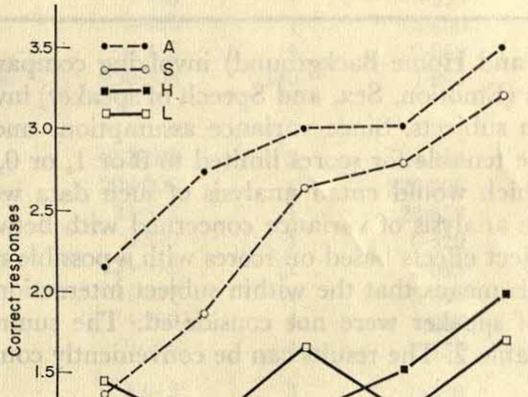

FIG. 1. Mean number of correct identifications of each emotion (max. = 4) at each age level (A = Angry, S = Sad, H = Happy and L = Loving).

TABLE 4. PERCENTAGE OF EMITTED ANGRY, HAPPY, LOVING AND SAD RESPONSES IN EACH GROUP

	Angry	Sad	Loving	Happy
O male	32	30	20	19
O female	31	28	19	22
N male	33	30	18	19
N female	30	27	22	21
Total	31	29	20	20

It appears that the main effects described above are consistent for all age groups except 6 yr when Sad voices are not recognized better than Loving ones. Breakdown of the interaction shows that the age trend is different for positive and negative emotions. Figure 1 shows that the increase with age is greater for A and S than for H and L. There is no difference between the trends for A and S, but there is a difference between L and H. Inspection shows this represents inconsistent changes with age for Loving compared with a consistent upward trend in the recognition of Happy.

In all groups there was a tendency to attribute negative rather than positive emotions to voices in a ratio of about 3 : 2, and Table 4 shows that the differences between sexes and groups with different backgrounds are negligible. (This pattern is also consistent for all age groups, though slightly less marked at 6 and 7 yr.) Since any superiority in correct identification of Angry or Sad could be due to this response bias in attributing negative emotions to voices, the emotional sensitivity scores were transformed into percentages of emitted A, H, L and S responses which were correct. These scores corrected for response biases are shown in Fig. 2. The superior recognition of negative over positive emotions is now much less clear, though Angry still appears to be recognized best at all ages, and there is also a very marked increase with age (from chance 25 per cent to 70 per cent) in the attribution of Happy to appropriate voices.

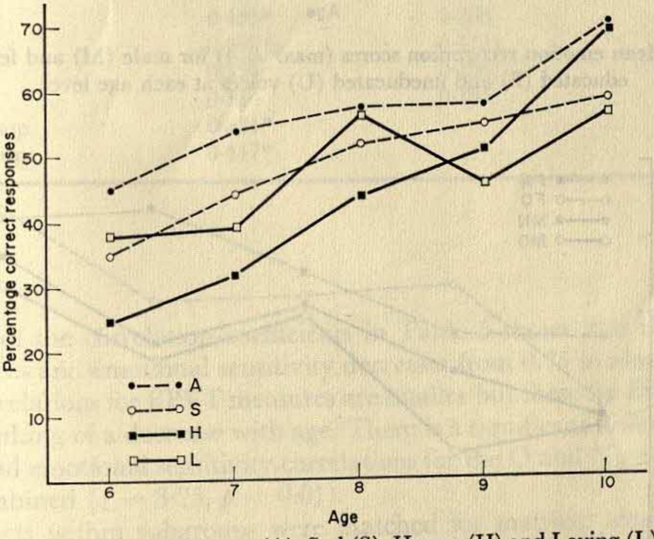

FIG. 2. Mean percentage of Angry (A), Sad (S), Happy (H) and Loving (L) responses which were correct at each age level. (Fig. 1 adjusted for total number of A, S, H and L responses.)

Sex and speech of speakers

The significant main effects for sex and speech of speaker in the analysis of variance reflect the superiority of subjects in recognizing emotions in female (mean = 2·23) rather than male (mean = 1·80) voices, and educated (mean = 2·19) rather than uneducated (mean = 1·84) voices. Figure 3 shows that these effects are complicated by an interaction with age. With female speakers, the difference between educated and uneducated voices is marked at 6 yr and decreases with age, eventually

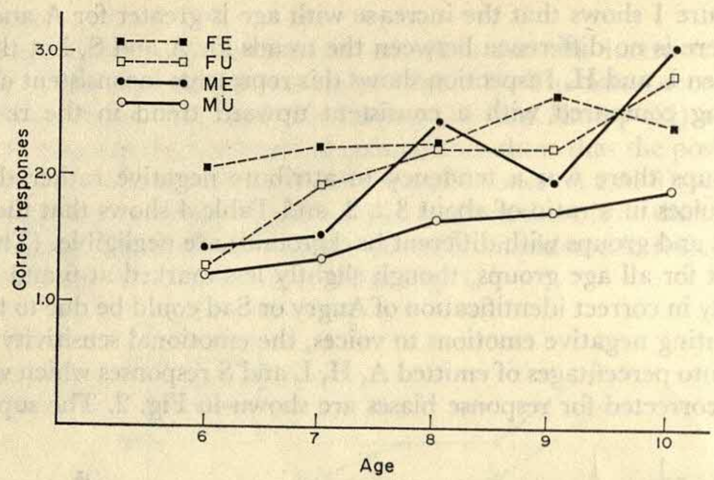

FIG. 3. Mean emotion recognition scores (max. = 4) for male (M) and female (F), educated (E) and uneducated (U) voices at each age level.

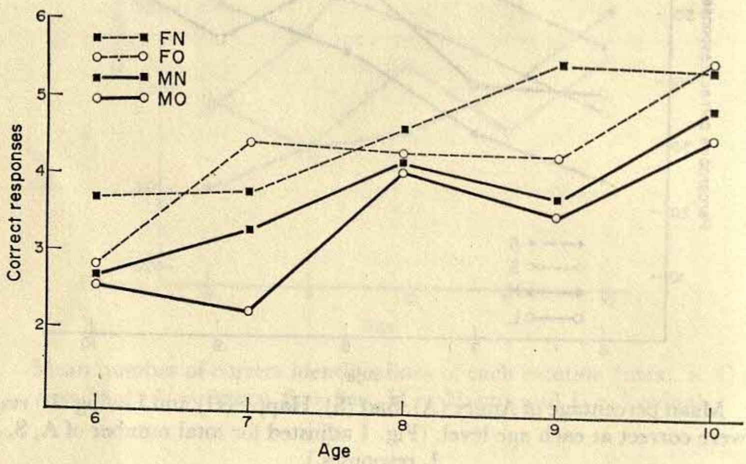

FIG. 4. Mean emotion recognition scores for male (M) and female (F) voices (max. = 8) at each age level in orphanage (O) and normal (N) home groups.

being reversed at 10 yr. With male speakers, there is little difference at 6 or 7 yr but marked differences at 8 and 10 yr. With male voices sensitivity to emotion in educated voices increases more with age, whereas the reverse is the case with female voices.

The other significant interaction between Home, Sex of speaker, and Age, can be seen in Fig. 4. This is the only occasion when there is any significant differentiation between Orphanage and Normal children in emotional sensitivity. In both O and N groups, emotion in female voices is consistently more easily identified than in males. With male voices, the N group is better than the O group at all age levels. With female voices, similar differences occur only at 6, 8 and 9 yr and the O group is better at 7 yr.

Emotional sensitivity and intelligence

Product moment correlations between total emotional sensitivity scores and (i) Raw matrices scores, (ii) Raw EPVT scores, and (iii) EPVT quotients were calculated for each age group, and the correlations for all age groups combined were also found for matrices and EPVT quotients. (The overall correlation for EPVT raw scores was not computed because 6 and 7 yr olds had a different form of the test from 8, 9 and 10 yr olds and a combination of these scores would be meaningless.)

TABLE 5. CORRELATIONS BETWEEN EMOTION RECOGNITION SCORES AND MATRICES RAW SCORES, EPVT RAW SCORES, AND EPVT QUOTIENTS, FOR EACH AGE GROUP AND FOR ORPHANAGE AND NORMAL GROUPS

Age	Matrices	EPVT raw score	EPVT quotient
6	0·754*	0·332	0·510†
7	0·455*	0·266	0·265
8	0·398‡	0·412‡	0·335
9	0·336	0·166	0·186
10	0·114	0·155	0·279
O group	0·631*		0·030
N group	0·447*		0·201

*$p < 0{\cdot}001$.
†$p < 0{\cdot}01$.
‡$p < 0{\cdot}05$.

Inspection of the correlation coefficients in Table 5 shows that the correlation between matrices and emotional sensitivity decreases from 0.75 to almost 0 by 10 yr of age. The correlations for EPVT measures are smaller but those for EPVT quotients also show something of a decrease with age. There is a significant difference between the matrices and emotional sensitivity correlations for the O and N groups when age groups are combined ($z = 3{\cdot}25$, $p < 0{\cdot}01$).

Since subjects within subgroups were matched for matrices scores, it is to be expected that analysis of variance of matrices scores yields F ratios less than 1·0 for all effects except Age ($F = 24{\cdot}97$, $df = 4140$, $p < 0{\cdot}001$). When an analysis of covariance of total emotional sensitivity scores is carried out with matrices scores as the covariate, the significant effect of age on emotional sensitivity is eliminated but none of the other effects are altered.

Although closely matched for matrices scores, there still appear to be differences in EPVT scores. The mean EPVT quotients for the main subgroups are Male Orphanage—86·05, Male Normal—93·00, Female Orphanage—82·10, Female Normal—85·88, and the age effects can be seen in Fig. 5. The results of an analysis of variance of the EPVT quotients are shown in Table 6.

There are significant effects for age and for sex of subjects. Males have higher quotients than females which is an effect to be expected on the basis of the norms of this test (Brimer and Dunn, 1962). The most important significant effects are the effects of Home and its interactions with Age and with Sex and Age. The mean for the N group is 89·44 compared with 84·07 for the O group, but Fig. 5 shows that the

TABLE 6. ANALYSIS OF VARIANCE OF EPVT QUOTIENTS AS A FUNCTION OF AGE, SEX AND HOME OF CHILDREN

Source	SS	*df*	MS	F	*p*
Age (A)	1824·963	4	456·241	3·366	0·05
Sex (B)	1226·557	1	1226·557	9·050	0·01
Home (C)	1150·257	1	1150·257	8·487	0·01
AB	179·162	4	44·791		
AC	1583·587	4	395·897	2·921	0·05
BC	100·805	1	100·805		
ABC	1713·788	4	428·447	3·161	0·05
Error	18,974·375	140	135·531		
Total	26,753·494	159			

interaction effects with age are fairly complex. With male subjects though O and N groups are very similar at 6, 7 and 8, the Orphanage group is considerably worse than the Normal group amongst 9 and 10 yr olds. With female subjects the O group is inferior at all ages except 9 yr, and the sizes of the differences are not a simple function of increasing age.

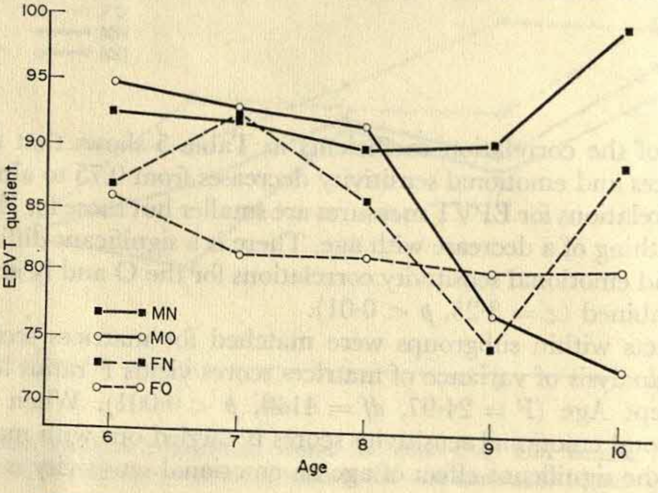

FIG. 5. Mean EPVT quotients at each age level for male (M) and female (F) subjects in the orphanage (O) and normal (N) home groups.

EPVT raw scores show similar trends and analyses of covariance of emotional sensitivity scores with EPVT raw scores as covariates (separately for 6/7 and 8/9/10 yr olds) were carried out. The adjusted sensitivity scores now show no effect of age, but for 8, 9, 10 yr olds the effect of sex of subject is now significant ($F = 4{\cdot}35$, $df = 1{\cdot}83$, $p < 0{\cdot}05$). The difference in emotional sensitivity between male and female children was not significant in the main analysis, but when scores are adjusted to take account of the superior verbal ability of the males, older female children show greater sensitivity than males.

DISCUSSION

There is no clearcut deficiency in emotional sensitivity in the Orphanage children compared with the children in normal homes. Even the non-significant trend in the expected direction is reduced when scores are adjusted for intelligence. The age changes in recognition of different emotions is also the same for both Orphanage and Normal groups. There is however an interaction between type of home background, age of subject, and sex of speaker. The orphanage children are consistently inferior in recognizing emotion in male voices, but differences are more variable with female voices. The O group's main social interaction is with a predominantly female staff, and they might be expected to be less used to male speakers than the N group. The effects described above may therefore be explicable in terms of the differential social interaction with different kinds of people, and consequent different amounts of experience with different kinds of speakers, rather than in terms of different specifically *emotional* experiences.

The other way in which it was hypothesized that Orphanage children might differ from those in normal homes was in their response biases in attributing emotions to voices. There is no evidence that Orphanage children with presumed more negative emotional experiences show any more negative bias than their controls. The evidence does not suggest that the presumed differences in backgrounds have any clear-cut effects at all on the perception of emotion in voices. It must be pointed out however that this does not necessarily mean that home background has no effect on emotional sensitivity, merely that the orphanage children are no different from comparable children in normal homes. The control children are all of low intelligence and also have "inferior" backgrounds, and both groups might be different from the population at large.

The other variable considered which relates to past experience is the speech of the speakers. It was considered that in the population tested, children would be more accustomed to uneducated than to educated speech, and thus might be more sensitive to emotional meaning in uneducated speech. The results show the opposite trend though this must be interpreted in the context of its interaction with age of children and sex of speaker. The recognition of emotion in male educated and female uneducated voices improves more with age than in male uneducated and female educated voices (Fig. 4). Though the superiority of female uneducated voices could be explained in terms of subjects' experience with this kind of voice, the other effects are much more difficult to explain in similar terms. It may be the case that the particular dialects/accents assumed by the speakers—the males in particular—were not sufficiently close to the uneducated speech to which the subjects were most accustomed, but a study by Eisenberg *et al.* (1968) suggests another possibility. These investigators, studying perception by 8/10 yr olds of intelligibility of monosyllabic speech of educated and uneducated speakers, found that educated speech was consistently more intelligible, independent of race or social class of the listeners. Racial variations in uneducated speech were more intelligible to listeners of the same race as the speakers, thus experience with variations of uneducated speech did lead to greater intelligibility, but such experience was not enough to overcome the superiority of educated speech. The findings in the present study suggest that a similar conclusion may apply to the effects of experience on the perception of emotional meaning in speech.

In spite of gross differences in subjects and materials, the results of the present study agree closely with those of Dimitrovsky (1964), not only with regard to age trends but also with regard to differences in recognition of positive and negative emotions and in response biases in attributing emotion to voices—the main difference being a reversal of the places of Angry and Sad. It is not possible to say whether such effects are to be explained in terms of stimulus or subject variables—the negative/positive difference could be related to differential discriminability of the relevant vocal cues which define the various emotions, or to the content of the message "I am going out now . . ." which might be associated by children with negative rather than positive emotions. It is not clear that a similar negative bias would occur in identification of emotions from non-vocal cues, since vocal and verbal cues may be more relevant in Anger and Sadness than in Happiness and Love. Feshbach and Roe (1968) found that Happiness and Sadness were identified more easily than Anger when 6–7 yr old children judged emotional meaning in a small number of situations depicted in slide sequences with an accompanying narration. On the other hand, the differences could reflect differential occurrence or importance of the emotions in different cultural/socio-economic/age groups. The finding by Lambert and Klineberg (1967) that there is a more negative bias in younger children's views of foreign peoples may suggest that such response biases are not confined to perception of emotional meaning, and thus be explicable only in more general terms. The clarification of these issues must await further experimentation.

An important discrepancy between the present study and Dimitrovsky (1964) occurs with data on the related variables of sex of subject and verbal intelligence. Both studies found correlations between verbal ability and emotional sensitivity significant only at youngest age levels, and Dimitrovsky suggested that this was because verbal ability played an important role in understanding of instructions. Dimitrovsky also attributed the superior emotional sensitivity of female subjects to superior language development. In the present study, correlations between emotional sensitivity and non-verbal matrices scores were greater than those for EPVT measures. This suggests that non-verbal ability may be more important than verbal ability and that the correlations in younger children are not simply an artefact of comprehension of instructions. The consistent drop in correlations with age does, however, agree with the findings of other investigators (Forrai-Banlaki, 1965; Davitz, 1964) that though a minimum amount of intellectual ability is needed for the emotion recognition task, increases beyond this level have no further effect in increasing recognition scores. Conn *et al.* (1968) found that children's sensitivity to teachers' expectations about changes in I.Q. varied with the children's sensitivity to emotional expression in voices, though as with the other emotional sensitivity studies they found interactions with sex of speaker, sex of child and type of I.Q. measure (verbal or reasoning) used. In the present study, where the subjects (especially the Orphanage group) may be expected by their adult contacts to be relatively dull, age variations in the correlation between I.Q. and emotional sensitivity could reflect to some extent the different effects of adult expectations on I.Q. measures as the children's emotional sensitivity increases with age.

The main analysis gave no confirmation of the superiority of female over male subjects found by Dimitrovsky (1964). This sex effect was significant, however, with older children when scores were adjusted for differences in verbal ability, because boys with higher EPVT scores performed worse than girls. This difference between males and females was not significant when matrices scores were used as the covariate. It is not true, therefore, in the present study that any superiority of girls over boys in emotional sensitivity can be explained in terms of greater language development, since it is only when verbal ability differences are eliminated that the sex difference is produced.

The EPVT scores by themselves are of interest because it is with these that the clearest differences between Orphanage and Normal children occur. Although matched closely within each age group for non-verbal ability according to the Matrices test, the Orphanage group is inferior to the Normal group in verbal ability as measured by their EPVT scores. This difference occurs only with older male children and less consistently among females. Whiteman and Deutsch (1968) found that socially disadvantaged children showed a deficiency in verbal ability that was greater in older children, and considered one of the most important aspects of social disadvantage to be "the children's interactions with adults in cognitively and emotionally stimulating settings" (p. 111). This type of variable would appear to be relevant in the present context, and its interaction with sex and consequent overall differences in verbal ability at different age levels serve mainly to make the pattern even more complex.

It seems, therefore, that though an orphanage background may affect emotional sensitivity in an indirect fashion by affecting experience with different kinds of speakers, or by affecting the development of verbal ability, the evidence does not suggest that differences can be attributed to differences in emotional background. Since the comparison of educated with uneducated speech also failed to show the effect one might expect on the basis of experience with particular emotional voices, it seems likely that the development of perception of emotional meaning in voices may be related less to specific experiences with emotional voices, than to the development of discrimination of vocal cues in voices in general.

SUMMARY

Eighty orphanage children, 6–10 yr old, were matched with children in normal homes and tested for recognition of emotion in speech. Recognition scores were higher for (a) negative than positive emotions, (b) female than male voices, and (c) educated and uneducated speech, though these effects interacted with age. Orphanage children showed no consistent differences from their controls apart from an inferiority in recognition of emotion in male voices. Recognition scores correlated with both verbal and non-verbal ability and correlations decreased with age. It is concluded that the developmental of emotional sensitivity is related more to general perceptual and intellectual factors than to specific experience with emotions.

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RESEARCH IN READING RETARDATION: TWO CRITICAL PROBLEMS*

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RESEARCH in reading retardation has a long history of conflicting results and opposing theoretical orientations. The conceptual frameworks of disciplines ranging from education to medicine have been used in numerous attempts to explain and treat the problems of students who have repeatedly failed to learn basic reading skills. Such diversity has been healthy, illuminating many different facets of the disorder, yet in spite of the intermittent efforts of many and the dedicated and continuing efforts of a few, there has been no real success in what, for the school child at least, must be the most important goals of such research: namely (1) to predict reliably in advance which students will have difficulty in learning to read, (2) to attribute specific cases of the disability to a particular cause, or (3) to develop remedial measures geared to the individual student. These goals, though they are by no means the only legitimate ones for research in the general field of reading, are the ones on which the comments and criticisms of this paper are ultimately founded.

Why has research been so unsuccessful in making progress toward these goals? It is argued here that there are two critical problems which have served to confuse issues and vitiate results. The first of these problems is simply one of definition, with all its attendant questions of generalization and replication. The second critical problem is one of inference, and has at its heart a fundamental disjunction between the statistical model which most studies have assumed and the model which may in fact describe the underlying relationships.

THE FIRST PROBLEM: DEFINITION

The *sine qua non* for systematic investigation would seem to be a good operational definition for the phenomenon under study, one which is unambiguous, in some sense meaningful, and capable of being used by independent investigators. There has been no such consistent formulation in studies of reading retardation, but rather a series of definitions developed independently in the various disciplines which have been brought to bear upon the problem. These definitions seem to be of three major kinds, though their interplay in the literature oftem makes it difficult to sort out a given definition into its constituent parts. One set comes from professional educators, another from psychologists, and the third from doctors in various fields of medicine.

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The educational issue

On the simplest level, retarded reading achievement is achievement not up to the level which would normally be expected of a person with an equivalent school background. This is the context in which educators usually begin their concern with reading retardation, and from it has come the widely used practice of defining a "serious" reading deficiency as two or more years below grade level. Serious deficiency has in turn tended to be termed "disability".

When reading levels become a political issue, as is regularly the case in many large American cities, it is such departures from "expected" grade level on one or another national standardization that are at issue. Large differences between expected and actual achievement implicate the entire educational and cultural milieu, and have led educators to such euphemistic categorizations as "the culturally deprived" and "the disadvantaged". It is this kind of statistic which is usually used, for example, to compare the average reading achievement of city and suburban school children (e.g. Eisenberg, 1966).

The medical syndrome

Since 1896 (Morgan) investigators have been aware that in addition to students whose achievement could be explained in terms of the variables usually of concern to educators, there is a class of individuals whose progress is retarded even when they are given all possible educational and cultural advantages. Most of the earliest cases were reported by ophthamologists, though over time primary concern has shifted from one to another medical area. Some cases have proved explicable in terms of known and obvious defects: subnormal general intelligence, impairment of vision, deafness, or brain damage. Yet many patients remain with no obvious abnormality other than their inability to learn to read. It is this last class which aroused original interest in the 1890s, about which Hinshelwood (1917) was concerned when he wrote his major monograph dealing with "word blindness", and to which has been given a succession of names ranging from "primary reading retardation" to "specific dyslexia", "strephosymbolia", "analfabetia partialis", and "congenital symbolambolia". Drew (1956) lists 14 such labels attached by investigators to essentially the same syndrome; and while admittedly many of the most unusual examples come from the early work on the problem, even recent writers continue to proliferate terminology.

Implicit in the terminology is the underlying view of reading disability as a unified syndrome in a medical sense, a collection of characteristic symptoms presumably indicative of a more basic disorder requiring treatment. Exactly what the disorder might be, whether it is specific to reading or considerably more general, may be open for discussion, but it is a disorder of the individual and hence a problem of a qualitatively different sort from those usually treated in educational research.

The research population

Research in the psychology of learning has tended to reflect a blend of the educational and the medical approaches to reading retardation, and from that blend has come much of the present confusion. From the medical literature, investigators have drawn the concept of a syndrome or pattern of deficits; from the educational literature, they have drawn the definitions of reading retardation; while from their own discipline they have drawn the set of intellectual and emotional variables which have been their chief concern.

Though the specific variables have covered a wide range over the past 70 years, the approaches to studying them have been remarkably consistent. Quite simply, the paradigm has consisted of a sample of retarded readers to be compared with a sample of normal controls in an attempt to distinguish significant differences. Even a cursory review of the literature, however, should make it clear that there is a hierarchy of interest as far as the variables to be studied are concerned, a hierarchy which is to a certain extent historical, reflecting variables whose effects were long ago discovered and thoroughly discussed, and partly accidental, reflecting the biases and training of the investigators. In any event, the experimental paradigm is quite quickly modified to impose one or another form of control upon those variables of less interest.

One form of control has been simply to apply rigorous standards for admission to the population from which the subjects are ultimately to be drawn. Thus investigators have selected their samples to reflect a homogeneous (usually white middle-class) background, free of any obvious organic defects, and of at least normal intelligence. Often too there is screening to eliminate emotional disorders. The exact limits imposed in delineating a sample depend upon the individual investigator's biases and interests, and *ad hoc* solutions have proliferated.

The second solution has been to control variables by taking them into account in the process of defining "expected" achievement. That is, the reading criterion itself is modified by making it a ratio or residual score taking account of the effects of general intelligence, social class, chronological age, grade age, achievement in other subjects, and so on. Either approach is quite legitimate as long as it is remembered that the variables which are controlled are not intrinsically of less importance in understanding reading retardation that those which are not controlled; the only real difference (at this stage of our knowledge at least) is that one set is better understood than the other.

Some confusions

The tendency of investigators to control what is known in order to focus more clearly upon what is not known is of course a quite natural and useful research strategy. This leads in the research literature to a constantly shifting definition of the population under study—and sometimes to a rather inaccurate conceptualization of the problem as a whole. Eisenberg (1966) gives an excellent definition of the research population as it presently stands: "operationally, specific reading disability may be defined as the failure to learn to read with normal proficiency despite conventional instruction, a culturally adequate home, proper motivation, intact senses, normal intelligence, and freedom from gross neurological defect".

The definition becomes misleading only when it is allowed to generalize, to become not just a research population but also a medical syndrome. But syndrome in its turn carries an as yet unjustified assumption of homogeneity in the population of reading disorders, leading to discussion and even research designs which focus upon *a* disability and *a* cause.

As presently defined, specific reading disability is a residual disorder, that is, it is that part of reading retardation which we have not been able to explain. As new associated defects have been found in one or another subgroup of the population of retarded readers, they have been splintered off and the question has arisen, are these "dyslexics"? Often the principal investigator says *yes* and those who follow, *no*. This curious ambiguity implies that "dyslexia" as such is an artifact of our lack of knowledge, and as a diagnostic category will gradually disappear as our knowledge increases. Within certain limits this has already happened: Eisenberg, who is unusually careful in his discussions of the etiology of the disorder, discusses the results of the currently popular tests of "auditory-visual integration" under the heading of "Sensory defects" rather than under "specific reading disability". Yet these tests were quite clearly used by the original investigators as relevant in distinguishing a particular subgroup of the latter population (Birch and Belmont, 1964).

"Dyslexia" in its present state of definition is probably best thought of as analogous to "low general intelligence", a description of a level of functioning with none of the implications of unity and specificity carried by the various syndromes that might cause the impairment. If and when dyslexia is given the kind of rigorous definition necessary to qualify it as a medical syndrome, the kind of definitions which have been given to such problems as Mongolism or PKU, then we would expect (as with the latter syndromes) that the low level of functioning would be a usual but not a necessary condition for diagnosis and treatment. We might even expect to find some individuals suffering from the syndrome whose reading levels were at least adequate (as might happen, for example, with a child for whom remedial work had been successful without treatment of the primary medical disorder).

Two classes of retardation

Discussion might be brought into sharper focus if a distinction were made between what could be termed the "extrinsic" or "social" and the "intrinsic" or "individual" influences upon reading achievement. The first set represent the variables which are essentially external to the individual—his home situation, opportunities for schooling, cultural milieu. Such variables vary greatly from community to community and have their effect on the morphology of the overall distribution of achievement. (That is, they shift the mean, variance, and normality of the distribution.) Change on these variables requires intervention at the institutional level.

The second set of variables are specific to the individual and represent his own peculiar combination of talents and abilities. Rather than affecting the shape of the distribution, these variables determine the particular position relative to other individuals within the same population group a given subject will take. Johnny's absolute reading level might be higher if he went to a school in Suburbia than if he were educated in Metropolis, but if relative to the other students in Metropolis his achievement were in the lower 10 per cent, it would probably also have been in the lower 10 per cent of suburban students had he been born and raised in the suburbs—even though his absolute "level" of achievement would have been considerably higher. In general, change on intrinsic factors requires remediation or treatment at the individual level.

The simplest way to view the distinction between the extrinsic causes of retardation and the intrinsic ones is that the former are characteristic of naturally occurring populations, while the latter are not. Though it is always possible to construct a whole population deficient in a given intrinsic variable, such populations do tend to be *constructed* by the investigator, rather than found as naturally occurring units in the way, for example, that a population of subjects deprived of adequate school experience can be roughly delineated by going into a black school in certain American cities.

A specification of a research population, such as that given by Eisenberg, naturally will include both extrinsic and intrinsic variables without differentiation. In generalizing results, however, the distinction becomes important: it will make considerable difference whether an attempt is being made to replicate results from the "lowest 10 per cent of the class" or from all students who are "two or more years behind national norms". Though both may obtain in the particular sample, the former may in fact hold across a range of populations differing along various sociological dimensions, while with the latter phrasing, which is more sensitive to extrinsic factors, results would probably be replicable only on an exactly comparable sample.

Incidence

Similarly, the problem of the incidence of reading retardation takes on quite a different significance depending on whether retardation caused by extrinsic factors, intrinsic factors, or both, is to be considered. In the past the choice has usually been made out of the investigator's interests, with little awareness of alternate possibilities.

Any study using a national sample (or a reading test with national norms) will get an incidence which reflects largely but not exclusively external factors. A poor school system will greatly increase the incidence of retardation; a good system will greatly reduce it. Within communities, however, intrinsic variables are probably of prime importance. Indeed, one might expect than an unusual proportion of retarded readers (relative to the community's own distribution of achievement) would be replicated in other communities, since the intrinsic factors producing such underachievement would be constant across communities in a way that the extrinsic factors (by their very definition) would not. (Of course this is an oversimplification, since many pathological conditions that are probably best thought of as intrinsic in our terminology are aggravated by certain social and cultural conditions. These interactions complicate but do not vitiate the basic premise.)

When a so-many-years-below-grade-level definition of disability is used, another problem arises. Figure 1 graphs the percentage of children meeting such a criterion of disability at different age levels, using the normative data on a series of silent reading tests widely used in American school systems. (Data from the October, February, and May administrations of each level of the test are graphed; grade-level norms are derived from raw scores from overlapping administrations of the test for each grade.) The graph makes it obvious that using this most-common operational definition of reading disability, the percentage of readers labelled "disabled" (and hence the incidence) is a sharply rising function of age. And while one can argue that different forms of retardation may have different ages of manifestation, this will hardly explain a rise in incidence from less than 2 per cent at the beginning of third grade to nearly 30 per cent by the end of ninth. It is certainly more reasonable to

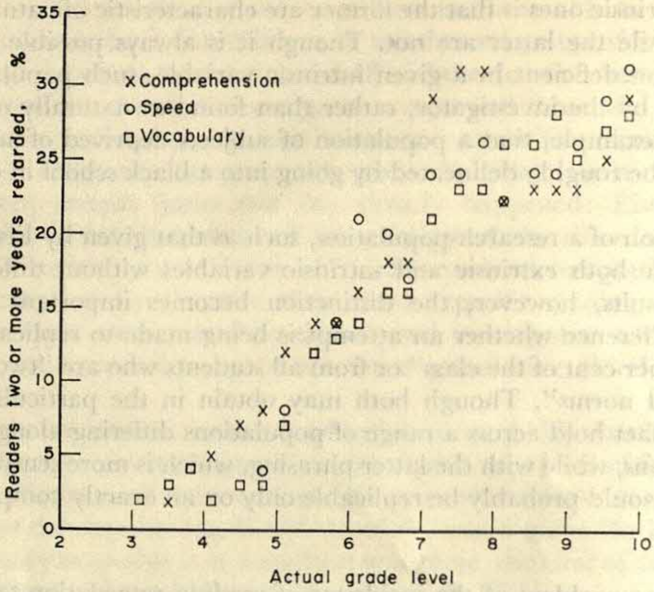


Fig. 1. The "incidence" of reading disability—from normative sample, reported by Gates and MacGinitie (1965).

suppose that a 2-yr deficit is in some sense a much larger deficit for a third than for a ninth grader, and hence attempts to compare the incidence at different levels when such a criterion is used are essentially useless. Since one or another form of this definition has been by far the most widely used index of disability, it is perhaps not accidental that the estimates in the literature span a nearly identical range of 1–30 with most hovering around 10 per cent (Bateman, 1966).

On the other hand, the opposite and equally meaningless extreme would be to base estimates of the incidence of reading disability on a definition which uses a deviation score. The expected level of incidence "found" in repeated investigations would then be an exact function of the cut-off score, and deviations from this expected value would be the result of random error.

The argument here has a tight circularity: Fig. 1 suggests one must exercise considerable care to find an operational definition that will keep incidence figures from different ages meaningfully comparable; to find such a definition implies the use of some kind of deviation score; the use of a deviation score makes incidence a function of definition. The only way out of the circularity is to realize that the meaningful question is the extent to which reading retardation should be regarded either as the lower end of the distribution of normal reading achievement or as an essentially separate syndrome with its own distribution. If the latter case holds (and it is the situation implicit in discussions of the disability as a syndrome), then the overall distribution of reading achievement should be bimodal, with a significantly larger proportion of retarded readers falling at the lower end than would be expected on the basis of the properties of the normal curve. (For measured intelligence, such a situation has already been demonstrated [Jensen, 1969; Zigler, 1967].) Were this to hold for reading achievement, the disproportion of subjects falling at the lower end of the curve could be accurately measured, yielding the most stable and least arbitrary estimate of incidence. If no such disproportion were found, on the other hand, the disability would have to be regarded as the extreme tail of the normal curve; incidence would then remain an arbitrary function of investigators' definitions.

At present, unfortunately, the distribution of achievement has not been subjected to the kind of careful study necessary to detect such deviations, and voices can be heard asserting that it is perfectly normal (Heller, 1963) as well as sharply distorted (Templeton, 1969). The many demographic surveys of reading disability have yielded interesting information about factors associated with retardation in the population as a whole, and have provided estimates of the scope of the educational problem involved. They have not been concerned, however, with separating the extrinsic from the intrinsic factors in a study of the total distribution of achievement so that an estimate could be made of the extent to which there is or is not such a disproportion of retarded readers after allowing for the extrinsic influences on achievement. (See Templeton (1969) and Ingram (1969) for a review of findings with respect to the general level of retardation from all causes, extrinsic and intrinsic.)

THE SECOND PROBLEM: THE STATISTICAL MODEL

Problems of definition and incidence open the way towards a discussion of some of the other critical issues in research on reading retardation. The tremendous bulk of research in the subject is widely acknowledged, and it has been regularly reviewed (Bateman, 1966; Ingram, 1969). Rather than duplicate the summaries of the kinds of factors (physical, emotional, intellectual, and perceptual) that have been implicated, we will focus here upon some of the issues which these results raise.

TABLE 1. THE SOURCES OF READING RETARDATION

A Extrinsic or social factors
  1 Quantitative and qualitative defects in teaching
  2 Deficiencies in cognitive stimulation
  3 Deficiencies in motivation associated with social pathology

B Intrinsic or individual factors
  1 General debility
  2 Sensory defects
  3 Intellectual defects
  4 Brain injury
  5 Deficiencies in motivation associated with psychopathology
  6 Specific reading disability

This is a modification of an outline by Eisenberg (1966).

Table 1 modifies an outline provided by Eisenberg (1966) of the factors associated with (and presumed to be causes of) reading retardation. (The modifications are mainly to maintain the distinction between extrinsic and intrinsic factors.) Though the underlying influences in the subcategories do overlap to a very considerable extent, this categorization does emphasize the psychologically most important aspects of the problem, as well as make evident what everyone admits to obtain but few deal with: the heterogeneity of the disorder.

The outline distinguishes from the start nine different "sources" of reading retardation, and even a cursory glance at the research should convince anyone that many of these categories blossom almost indefinitely. Sensory and intellectual defects in particular have been investigated from many different points of view—and a not very extreme interpretation of the results would suggest that almost any kind of ability, performance, or response has been implicated at some time by someone, and an astonishingly large proportion of these results have been replicated.

Replicable has not always meant useful in this field of research, however, with the unfortunate result that the three goals outlined at the beginning of our discussion remain out of reach; we have still learned little which can directly benefit the individual child.

Why has research been so unsuccessful in this regard? A typical study of reading disability begins with the hypothesis that a given factor is essential in learning to read, with a set of measures of the factor and of reading ability, and with some statistical procedures which allow the hypothesis to be tested on the basis of the performance of a given sample of subjects. When the results obtained are inconclusive, or indicate a relationship so weak (even if statistically significant) that it adds little to our knowledge, one is faced with a problem of inference. The two most common kinds of conclusions involve either the hypothesis or the instrumentation. That is, the investigator will usually conclude either that the factor he was studying is of little importance in the problem, or that his measures of the factor were too crude to provide a good test of the hypothesis.

Each of these inferences is probably accurate for certain phases of past research in reading retardation. It seems reasonable to conclude, for example, that gross visual and auditory defects do not account for most forms of the disability, thus rejecting the hypothesis of a number of early investigators (Edson, 1953; Reynolds, 1953). At the same time, instrumentation seems to have been at least part of the problem in research into the relationship between laterality and reading problems, so that we have witnessed a succession of progressively more sophisticated measures of "sidedness" (Shankweiler, 1964).

Yet when there has been an intensive research effort involving many different investigators with a variety of hypotheses and successively more refined instrumentation, it is legitimate to ask if there might be another kind of inference to be made from the overall lack of progress towards understanding the disorder. Given a correct general hypothesis that a given ability is involved in and necessary to reading, together with adequate measures of the abilities involved, there in fact remains a third though far less frequent cause of negative results: there may be a lack of fit between the mathematical model on which data analysis is based and the actual structure of the data. The most widely used statistical methods for analysing data and testing hypotheses have proven themselves to be applicable to a wide variety of research problems, and to be vigorous enough to permit valid inference under quite a range of departures from the assumptions under which they were derived. Yet there are certain kinds of data structure which the simpler models cannot adequately handle, and heterogeneity is one of them. To see the implications of data structure on results in the field of reading disability, let us begin with a relatively unmathematical formulation of the statistical problem faced after a pool of data has been collected.

Any investigation of the problem of reading disability begins with a set of scores x_1 to x_n on measures the investigator expects will be relevant to reading ability, and with a score y which indicates performance on a reading criterion. (The score y may have any of a number of forms, ranging from a representation of grade level or grade discrepancy to a dichotomous value specifying adequate/inadequate.) Any analysis carried out on the x's in an attempt to predict y, or to describe the differences between groups specified in terms of relative scores on y, is predicated, consciously or not, on some mathematical model of the functional relationship between the two sets of variables.

The possible forms for the functional relationship between the dependent and the independent variables are theoretically unlimited, but most of them are highly unlikely to obtain. It will be useful, however, to review the major models on which previous research has been based, to describe the results to be expected if a given model in fact holds, and to consider a second series of models which may offer a more successful description of the parameters which future research in reading disability should be seeking to define.

For simplicity these models will be developed as though the criterion of reading retardation were clearly specified by a simple, single variable measuring "achievement". In fact it is more reasonable to assume that reading retardation itself has many different forms, corresponding perhaps to a model such as that proposed by Wiener and Cromer (1967). As long as the form of disability being investigated is clearly specified, and is not confused with the form in other studies which have used a different criterion, our neglect of this aspect is not serious. One must remember, however, that full understanding of reading retardation will involve knowledge both of the various kinds of disability and of the various causes—simple and complex—of each kind.

Model 1*: A single causal defect*

The simplest structure which the data might have would occur if poor readers represent a homogeneous population deficient in a single ability essential in learning to read. Then one would find that groups of good and poor readers would differ on measures of the essential ability, and that individuals within each group would correspond most closely to their own group mean. Though the absolute level of the ability might vary within each group, this variation could not overlap (with the few exceptions generated by measurement error). That is, all good readers would be better than any bad reader on measures of the ability.

No investigator has produced results that could seriously be interpreted in light of this model. The only one of the large range of measures that have been used in the study of reading disabilities which has been able to distinguish groups in this manner is the reading criterion itself, and that of course is tautological. (A few "independent" variables that depend themselves on reading are part of the same tautology.) Figure 2 shows scatter plots of the kinds of relationship between reading

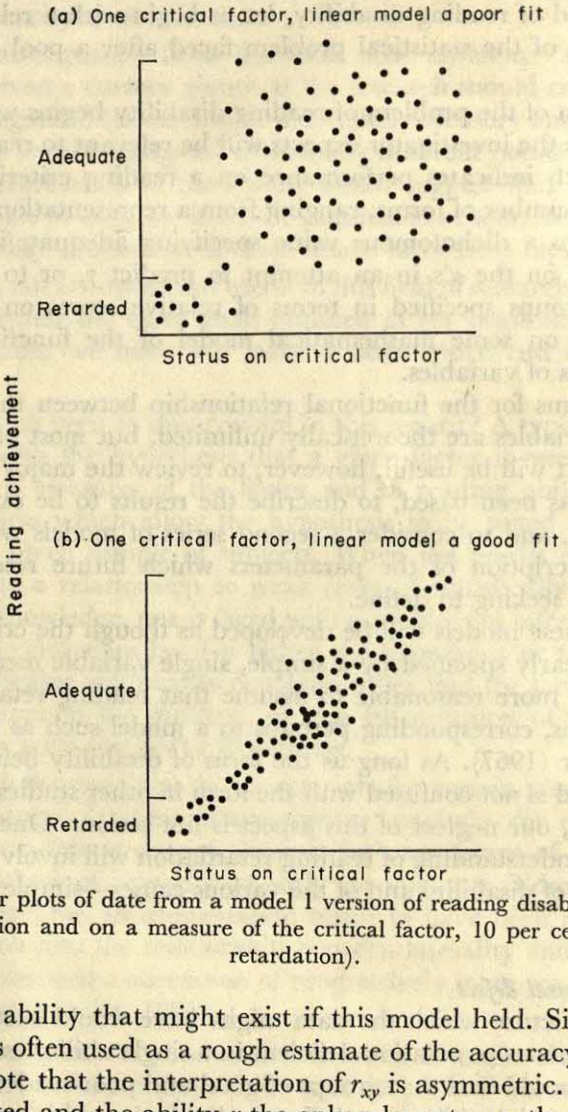


FIG. 2. Scatter plots of date from a model 1 version of reading disability. (Scores on reading criterion and on a measure of the critical factor, 10 per cent incidence on retardation).

and the essential ability that might exist if this model held. Since the correlation between *x* and *y* is often used as a rough estimate of the accuracy of this model, it is important to to note that the interpretation of r_{xy} is asymmetric. If reading ability is normally distributed and the ability *x* the only relevant one, then an r_{xy}^2 of nearly 1 will always indicate the model is relatively accurate, but a low r_{xy}^2 is evidence against the model only under the assumption that reading retardation is not a special disability, but only the lower extreme of normal variation on the critical ability as in diagram 2*b*. If it is a special defect then diagram 2*a* might be a more accurate case, and r_{xy}^2 would *not* be expected to approach 1. Thus simple inspection of the data remains the best check on the accuracy of this model.

Though no one has been able to produce data which conform to this model, discussions of the disorder often have buried in them a conceptualization of reading disability in these terms. Most attempts to relate a heterogeneous symptomotology to an "underlying disorder" share this model, the assumption being that the operationalization of the x-variable has been inadequate. That is, some investigators have assumed in their discussion that such diverse measured results as stuttering, mixed sidedness, or lack of comprehension each appearing individually in different subjects are caused by identical central dysfunctions of which we have no direct measures. Bender's (1958) theory of maturational lag postulates exactly such a single underlying disorder to explain a wide variety of phenomena.

Model 2: Several independent causal defects

The simplest extension of the data structure in model 1 would maintain the basic causal relationship between lack of a specific necessary factor and reading disability, but would allow for the possibility of a number of "critical" abilities, the lack of any one of which would be sufficient to cause the disorder.

If one had some *a priori* basis for discriminating subjects into groups each member of which had the same underlying deficit the data would then be expected to perform as in model 1. That is, the performance of good and bad reading samples on measures of the relevant ability would differentiate the two groups completely, and any overlap would be due to measurement error. Figure 3 gives some scatter plots of the relationship given two discrete syndromes equally represented and a control population of normal readers.

Unfortunately the problem has been that there are no such *a priori* grounds for classification of poor readers into homogeneous subgroups within which the search for the relevant specific factor can then proceed. Rather the typical situation has been that depicted in Figs. 3e and f, where the two syndromes have been pooled into an undifferentiated sample of poor readers whose performance on various tests is typically compared with a sample of normal readers. In this situation even the best results will confound the underlying true situation.

Even with the simplifying assumptions of Fig. 3, some of the problems are clear. To begin with there is now considerable overlap in the performance of the two reading groups on both of the measures. Thus with small samples one would expect that, just because of normal sampling variation, there would be contradictory and inconsistent results from successive investigations with new samples. Given large enough samples ("large enough" depending directly upon the number of discrete causes confounded within the population being sampled) then some stable large-group differences would emerge.

This model comes much closer than the first to explaining the results which have been reported in the literature. It would explain why investigators have not been able to derive a stable description of the disorder, why there are so many conflicting results, especially from studies with relatively small samples (sample n's under 100); why significant differences between groups of good and poor readers emerge with large samples; and why these differences, while replicable and in some sense real, are of little clinical value.

Looking at Figs. 3e and f, it is clear that if one took samples of subjects whose performance was especially high or especially low on a relevant factor, then there

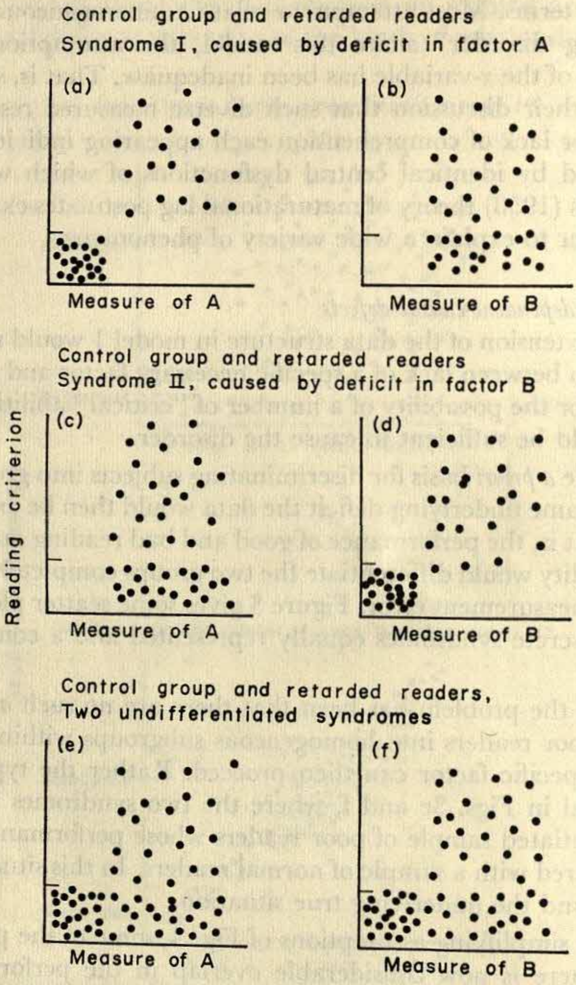


FIG. 3. Scatter plots of data from a model 2 version of reading disability. (Scores on reading criterion and measures of factors A and B, from two syndromes with 20 subjects each and a control group of 20 adequate readers.)

would be sharp differences in the reading performance of the two groups. It should even be possible with successive samplings to specify the critical value for the factor, so that if one divided a new sample into groups above and below the critical value, all below it would be poor readers. (The group above would include a mix of good and poor readers, the latter having the disability from another cause.) Ultimately, if this model held, it would be possible to define a function such that if the score of a given subject fell below any factor's critical minimum, that subject would have a reading disability, and, allowing for testing error, every subject who scored above the minimum on every relevant factor would be at least an adequate reader.

Though there have been no attempts to search for such cut-off values for each factor considered relevant, a few experiments have taken the first step of comparing the reading performance of subjects known to be high and low on the factor whose relationship to reading is being considered. John Money is his work with Turner's syndrome has used this latter approach with a disability which he calls "space-form blindness", a deficit similar to one often reported in the comparison of good and bad readers. He found that his group of subjects with space-form blindness were *not* deficient in reading level (Alexander and Money, 1965). Kinsbourne and Warrington (1963a, 1963b, 1964), on the other hand, found in their work with Gerstmann's syndrome that subjects characterized by severe finger agnosia did tend to show a corresponding reading and spelling disability.

Model 3*: Multiple regression with one functional relationship*

The number of critical factors that could be involved in model 2 is enormous, and the more factors actually involved the more extreme the cut-off values would necessarily be. Thus, for example, if the disability as a whole has a 10 per cent incidence and consists of 10 equally distributed sub-syndromes each with a critical factor, then the cut-off score for a given factor would represent the score of 1 in 100 subjects, or roughly 3·5 standard deviations below the mean. It is not implausible to argue that if such an extreme deficiency were the cause of the problem, it would have been recognized long ago.

Thus many investigators postulate instead that reading achievement is a simple additive function of the level of each of the factors involved, described by a multiple regression equation of the form $y = b_1 \times x_1 + \ldots + b_k x_k$. Once the parameters in this model have been defined, there are literally an infinite set of values for the x's (assuming at least two factors are relevant) that will yield a given value of y. With this model one would not expect to find critical minimum levels of ability on any underlying skills, or to be able to isolate any discrete syndromes.

The effectiveness of this model in explaining reading achievement depends upon two different assumptions of homogeneity. The first is the assumption that the criterion variable is normally distributed, reflecting no qualitative shifts in the performance of good, average, and poor readers. That is, one expects that exactly the same set of variables will distinguish the just-above-average from the average as will distinguish the moderately retarded from the severely retarded reader. The second assumption of homogeneity is that each subject's reading achievement is being determined by the same regression equation that determines the achievement of every other subject in the sample. Any two subjects with the same scores on all the factors in the equation would then be expected to show the same level of achievement (again excepting measurement error).

Model 4*: Multiple regression with several functional relationships*

Directly analogous to the simple regression situation in model 3 is the case where all instances of reading disability can be explained in terms of additive functions of the factors involved, but in which there are two or more regression equations functioning within the same sample. One might expect, for example, that the regression parameters would be different for boys and girls, for different age groups, or for different social classes.

With this model it is absolutely necessary that the sample be subdivided into such groups before the analysis begins; all of the assumptions of homogeneity in model 3 continue to apply to model 4 at the level of the particular regression equation that functions in each subsample. To the extent that a proper division of the sample is not made, the usefulness of the model will be attentuated. (Divisions such as sex and social class are relatively obvious; there is unfortunately little reason to suppose that the ones of most importance in the study of reading retardation will be so apparent. Subjects with differences in impulsivity, cognitive style, mood, even early teaching methods might conceivably form natural subgroups responding to different regression equations across the whole range of achievement.)

A great deal of research has been done using regression models and various tests of significant differences based upon them. In terms of general explanatory power they have proven most satisfactory in explaining the relative position of individual readers within the middle range of achievement; they have not been very successful in accounting for severe reading retardation.

The analysis of variance is often used in conjunction with these models, and it relies upon exactly the same assumptions and statistical techniques. (Any given analysis of variance can in fact be formulated as a regression equation.) When analysis of variance is being used, the primary assumption of homogeneity is that the subjects within each cell are behaving similarly, so that the effect of a change in the level of the variable being analysed will be the same for all subjects within the cell. Then an average effect will be produced across the whole cell, and tests of significance can be based on expectations about these average effects. Interaction effects in this model provide some test of the degree of homogeneity between cells, but if there is within-cell heterogeneity to begin with, important relationships will again be obscured.

For the moment, the fact that these models have not provided a good prediction of disability, but have worked even moderately well only within the range of relatively normal ability, can be taken as one kind of evidence of a disjunction between the statistical techniques and the data structure. Since they are so widely used, and since they break down under undifferentiated heterogeneity, some of the direct evidence for heterogeneity needs to be presented.

The heterogeneity of reading disorder. Clinical observations of "heterogeneity" in reading disorder are legion, but there have been few systematic attempts to investigate the possibility of stable subgroups within this heterogeneous population. Various investigators have attempted to establish diagnostic categories for the WISC similar to those that have been shown with adults on the Wechsler-Bellevue scales, but such attempts have been vitiated by the relatively low reliabilities and high intercorrelations of the subtests (Hopkins, 1964; Glasser and Zimmerman, 1967). Indeed results with subtest patterns have been remarkably close to those expected with a model 2 version of the disorder: consistent large-group differences have been found, but they suggest a pattern which in fact *none* of the individual readers show in full (Huelsman, 1970).

Results with discrepancies between the Verbal and Performance subscales have been similar: a group mean for Performance I.Q. significantly higher than the Verbal, but only 60 per cent of the subjects showing a difference in that direction and as few as one-fifth showing a large (15 point) discrepancy. Yet given that these patterns do not define the group, there is some evidence that they are of use in separating out subgroups within the total sample. Boder (1966) reported that a low Verbal score "is more frequently associated with the familial genetic type of dyslexia, whereas a low Performance score . . . is more frequently associated with the dyslexia encountered with chronic brain damage". Kinsbourne and Warrington (1963) similarly found that the direction of such a discrepancy would predict problems of finger differentiation as well as impairment of arithmetic ability *within* a sample of disabled readers, though no pattern could be considered characteristic of the group as a whole. As Huelsman (1970) concluded after an extensive review of the research and an equally extensive study of his own, further attempts to find stable total-group patterns with the WISC seem "relatively useless"; use of the subscores for differential diagnosis offers more hope.

Another approach to such data is suggested by a recent series of studies by Lesser *et al.* (1965). Interested in the effect of ethnic group membership on ability, they devised a series of tests measuring four relatively independent abilities (Verbal, Reasoning, Number, Space) and administered them to groups of Chinese, Jewish, Negro, and Puerto Rican first-grade children. They found, to their own surprise, that the *pattern* of abilities of the 320 children varied with ethnic group membership, and that social class variations shifted only the overall level of the pattern, not its basic organization. That is, the relevant dimension in their analysis turned out to be the extent and direction of the differences between the relative level of development of each ability within a given group of subjects, when compared to each of their other abilities, *not* the extent to which their average score on a given ability differed from the average scores of the other groups on that same ability. Further, and in some ways most important, individual subjects could be correctly grouped on the basis of their score profiles alone. A replication of the original study produced essentially identical results, while a follow-up study indicated the patterns remained stable over at least a 5-yr period (Lesser, Fifer and Clark, 1965; Stodolsky and Lesser, 1967; Fort, Watts and Lesser, 1969).

There is evidence for subjects with reading disorders that such patterns are remarkably stable. Reed (1968), comparing first- and fourth-grade poor readers on a variety of measures (including cognitive, psychomotor, perceptual, and motor functions), concluded that it did not appear that poor readers at the two ages—chosen to represent quite different stages in the reading process—were characterized by different sets of deficiencies. Coleman and Rasof (1963), using WISC subtest patterns, found that the shape of the pattern varied with relative achievement, the level varied with general intelligence, and that neither shape nor level varied with age. Cawley, Goodstein and Burrow (1968), coming at the problem somewhat differently, demonstrated that the kinds of reading errors and psychomotor characteristics which discriminate between good and poor readers of average ability discriminate in the same manner between good and poor readers among mentally handicapped children. Finally, recent follow-up studies of children with reading disabilities treated at the Bellevue Mental Hygiene Clinic between 1949 and 1952 found that although some of the subjects had compensated for their problems enough to achieve an adequate reading level as adults, the clinic patients were still distinguishable from the control group on a variety of cognitive and psychomotor tasks (Silver and Hagin, 1964).

These studies deal with group differences rather than individual patterns, but the kind of stability they indicate could well be produced by the interaction in each sample of various subgroups themselves of stable pathology. With the small numbers in the Bellevue follow-up studies, the conclusion that the pattern of ability of each subject remained stable is almost unavoidable.

A few attempts have been made to characterize the subgroups among retarded readers. Ingram (1963), on the basis of clinical work with 78 children, outlined three kinds of deficits he thought were present in his population: visuo-spatial problems, correlating (symbol-sound) difficulties, and speech difficulties. These categories, while an interesting beginning, are clinical rather than operational descriptions. Ingram provides no information on methods for discriminating between the groups, nor about the reliability with which a subject's classification could be determined.

Boder (1968), on the other hand, described three syndromes based on patterns of reading and spelling performance: a symbol-sound deficit, a problem in remembering visual gestalts, and a combination of the first two problems. She reported that individual patterns remained stable throughout the period her subjects were under study, in some cases up to 5 yr.

Finger agnosia, a disorder long associated with the Gerstmann syndrome, has been the focus of a series of studies by Kinsbourne and Warrington (1963a, 1963b, 1964). Working primarily with small samples in a clinical setting, they have used a set of simple tests of finger differentiation and order to discriminate among poor readers, and have then demonstrated that the groups failing the finger tasks show a significantly different pattern of performance on such varied measures as the WISC and a test of spelling ability. This work is probably the most successful single attempt to demonstrate a clinical homogeneity within one carefully defined subgroup of the population of retarded readers.

A study by Smith and Carrigan (1959) is unique in its attempt to show a congruence between patterns of disability on a variety of psychological tests and various physiological variables. Beginning with a cluster analysis of scores of 40 retarded readers on 15 tests ranging from digit span to flicker fusion, 5 syndromes were derived for further study. The same subjects were then given a comprehensive physical examination, including laboratory analysis of urine and blood specimens, with results for each variable reported separately for each of the 5 previously derived syndromes. The study has a number of serious defects, including a small sample size, lack of replication, lack of normal controls, and use of relatively unreliable instruments; yet it is still interesting that a finite number of subgroups did emerge from the analysis, groups which showed a number of significant differences on a series of measures unrelated to those by which they were originally discriminated.

In general it is fair to conclude that while there has been no entirely successful attempt to differentiate the population of reading disabilities into homogeneous subgroups, there have been enough encouraging results to suggest that such a division may ultimately be possible. These studies, while by no means definitive, suggest some new ways of approaching the data, as well as the benefit inherent in taking careful account of the model which is assumed to apply. Thus Kinsbourne and Warrington in their studies make use of a model 2 version of the disorder, selecting the populations they want to study on the basis of a factor they think is important and designing their studies as carefully as possible to ensure interpretable results if model 2 in fact holds. Because they viewed the disorder in this way, they did *not* begin by comparing the performance of groups of good and poor readers on tests of finger agnosia.

The studies by Lesser *et al.* and by Smith and Carrigan suggest a completely new set of models which need to be considered. Some of the possibilities are summarized as models 5 and 6, the first of which is presented mostly as a logical but not likely step along the way to the last.

Model 5 *: Disorder dependent on pattern of factors*

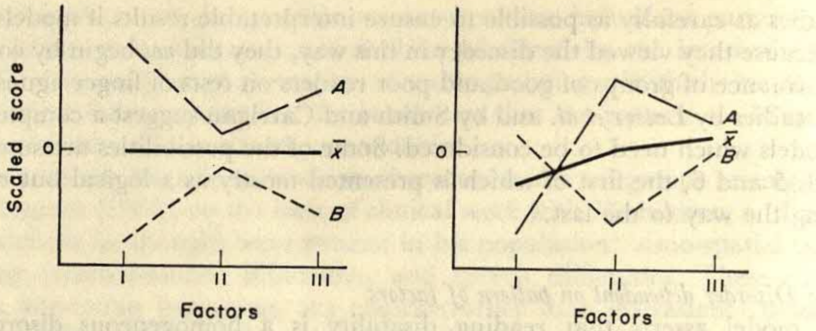
This model asserts that reading disability is a homogeneous disorder, and depends upon an interaction of relative status on various factors. The characteristic of the bad reader might, for example, be poorer auditory memory than visual memory, rather than an absolute deficit in one ability or the other.

If this model in fact holds, in an investigation comparing group means and variances on single tests just about *any* result would be possible. The only consistent finding would be that poor readers would always do better on test 1 than on test 2, but if the investigator were not specifically looking for the interaction, it would probably not impress him. (Thus in the literature on WISC patterns of good and poor readers, some investigators have ignored their own findings that poor readers as a group do better than the norm on Picture Completion.) Further, if it is the relative levels of the abilities that is important, and not their absolute levels, then this model provides no expectation about differences between good and poor readers in the absolute levels of the abilities in question.

Model 6 *: Several independent disorders dependent on patterns of factors*

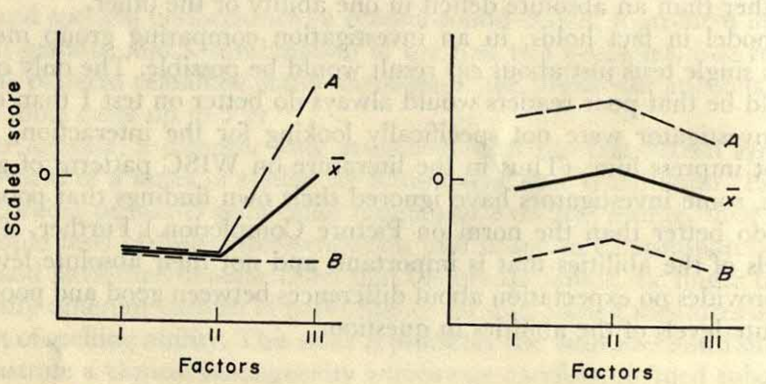
Model 6's relationship to model 5 is analogous to that of model 2 to model 1: the important dimension continues to be the same, but more than one syndrome of disability is assumed possible. Thus in model 6 reading disability can be caused by any of several relevant and independent patterns of factors. In this case, the results of group comparisons would depend entirely on the nature of the relevant interactions. The best that might be hoped for would be some relatively stable group patterns with large *n*'s (where the assumption would be that the various patterns of disability would be represented in roughly equal proportions in different samples). One should note, however, that it is perfectly possible for the critical patterns to be so distributed in the population that *no* group differences would emerge between good and poor readers. Further, even if such group patterns do emerge, they would represent the average of several quite different patterns, and the group patterns would quite likely not be like any of them.

Figure 4 illustrates some of the results of averaging, assuming only 2 patterns, 3 relevant factors of abilities, and equal frequency within the population of reading disorders. Since a scaled score of zero on these graphs is the average score expected from a population of normal readers, Fig. 4a represents a case where there would be no group differences at all in the scores of good and bad readers. In Fig. 4b the "group" pattern has a shape of its own different from the shape characteristic of either syndrome; in Fig. 4c bad readers might incorrectly be assumed to be homo-



(a) No difference from good readers

(b) Group pattern for bad readers unlike either syndrome



(c) Two factors correctly distinguished, one ignored

(d) Shape correctly portrayed, but level destroyed

FIG. 4. The interaction of patterns of reading disability (3 relevant factors, 2 syndromes). Profile —— mean; – – – – syndrome A; . . . . syndrome B.

geneous on the basis of the first 2 factors; and in Fig. 4d both syndromes show the same shape but very different levels.

Models 5 and 6 present therefore a new and difficult problem of analysis: how to compare simultaneously status on a number of variables. Lesser *et al.* were working with known groups, and the emergence of characteristic group patterns of ability was an incidental result. If model 5 held, a similar stable and characteristic group pattern could be expected to emerge from any study of poor readers. Model 6 could be similarly investigated if there were any *a priori* grounds for classifying poor readers, but no one has yet produced good ones. Smith and Carrigan (1959) have used one of the possible approaches in this situation; that is, they clustered together subjects whose scores taken all at once were in some sense "close".

Cluster search

Techniques for searching for homogeneous groups of subjects within a heterogeneous sample measured on a range of variables exist, though the methodology is not very highly developed compared with that now commonly used in research on reading disability. For the most part procedures have evolved independently in several substantive fields, and go under a variety of names ranging from "cluster search" and "numerical taxonomy" to "profile analysis", "pattern analysis", and so on (Sokal and Sneath, 1963; Cattell, 1966). Though this is not the place for a thorough discussion of the details of the many techniques which have been proposed, a brief look at the general statistical problem which all must attempt to solve may make the implications of models 5 and 6 somewhat clearer.

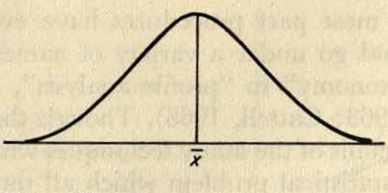
All the procedures which have been proposed have in common a desire to find, from a given collection of data points, some coherent structure which can be used to define the observed patterns of variation. Structure, however, is here considered to be taxonomic, imposed across individuals in the way that biological classifications of species are imposed across specimens. (This contrasts with the more usual analyses which impose structure across variables.) A complete analysis must ideally both define the structure and also demonstrate that there are in fact basic types distinguishable within the sample, rather than merely random deviation outward from the mean profile of the group. Mathematically, this can be viewed as a search for distinct clusters of points in the test space, as opposed to a single dominant hyperspheroid.

More simply, we are asking whether the scores of the subjects suggest that the sample is homogeneous or heterogeneous. Figure 5a is a frequency distribution for one variable, showing the familiar normal curve. For a single variable this is the expected distribution if the group were homogeneous; Fig. 5b indicates the results if the group were heterogeneous with two syndromes; and 5c the results if it were heterogeneous with several syndromes.

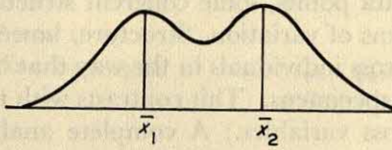
Figure 6 presents the scatter plots for the analogous situation in 2 dimensions, where the axes represent (uncorrelated) test scores and the points the individual subjects' scores. Figure 6a approximates the expected results if the sample is homogeneous; 6b, 1 possible result if it is heterogeneous with 2 major groups; and 6c, the results if it contains several distinct subgroups. In situations where the scores of bad readers are distributed in ways analogous to Figs. 6b or c, model 6 might be expected to provide the most accurate description of the disability, each cluster of points corresponding to a specific pattern of scores on the several variables. The situation so easy to visualize in 1 or 2 dimensions generalizes directly to the situation with many variables, though the latter cannot be directly displayed graphically.

Notice that in any of the figures we could artificially create any given number of "patterns" by simply partitioning the space—by splitting subjects, say, into those above and those below the mean on one of the variables. Such a partition would create mutually exclusive "groups" of bad readers, but the groups would simply beg the question of whether or not there are naturally occurring subgroups in the population. Unfortunately almost all present techniques of cluster analysis always yield groups at one stage or another (simply because random variation will make some points closer together than others), so it is always necessary to have some (usually extra-statistical) way to validate the groups that result.

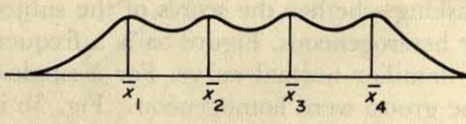
There are a number of more thorough discussions to which one can turn for guidance, though almost all writers in this field have their own, usually opposed, solutions to the methodological and statistical problems. The most complete dis-



(a) One variable, one group with mean $\bar{x}$



(b) One variable, two groups with means $\bar{x}_1$ and $\bar{x}_2$



(c) One variable, four groups with means $\bar{x}_1$, $\bar{x}_2$, $\bar{x}_3$, and $\bar{x}_4$

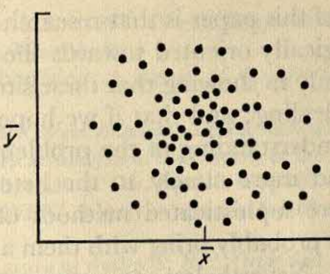
FIG. 5. Distribution of a single variable in a sample representing 1, 2 and 4 homogeneous groups.

cussion is that by Sokal and Sneath (1963), though they are writing from the point of view of biological taxonomy. Cattell (1966) has provided another lengthy discussion of the subject, especially as it relates to psychological research; both include comprehensive bibliographies with very little overlap between them. Still, real solutions to the many problems inherent in these procedures will evolve only as various investigators begin to apply them to their data, thus building up some empirical criteria to guide the many subjective decisions that at present are involved.

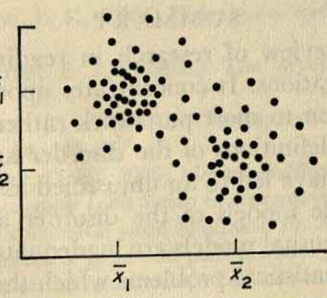
Some notes on the real world

All 6 models are set up in terms of the etiology of "the" disorder, an approach which ignores the problems of definition outlined in the first section of this paper. Achievement in such different aspects of reading as oral reading, spelling, silent reading comprehension, and speed of reading show only a moderate degree of intercorrelation, and a given student may be retarded in any one, or in any combination of these skills. Though not likely, it is at least possible that the model which will successfully describe retarded reading on one of these dimensions will not be the one that fits some other dimension.

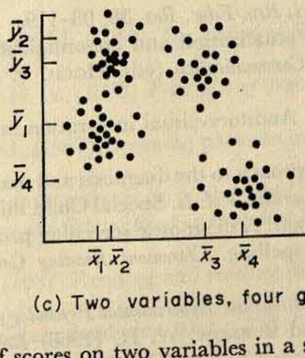
Even within a single dimension, however, there is no reason to suppose that the 6 models must be mutually exclusive. There may be some retarded readers who are



(a) Two variables, one group



(b) Two variables, two groups



(c) Two variables, four groups

FIG. 6. Distribution of scores on two variables in a sample representing 1, 2 and 4 homogeneous groups.

best explained by the general regression equation of model 4, others who have a single-factor deficit as in model 2, and still others who exhibit some characteristic pattern of relevant abilities as in model 6. When one begins to bring these various models and complications of models together, and combines them with the number of independent factors that could conceivably be used to define the various parameters within each model, the resulting matrix of possibilities is overwhelming.

The only sensible approach, of course, is to start with the simplest reasonable explanation, and only as that proves inadequate to move towards more complex models. Yet the major point of this paper is that research in reading retardation has for too long been methodologically oriented towards the simplest models; that this research has been successful only in showing that these simplest models do not fit the problem with which we are dealing; and that if we hope in the future to add anything of significance to our understanding of the problem, we must concentrate on new models which correspond more closely to the heterogeneity of the disorder. Such a shift will require more sophisticated methods of analysis than have been employed in the past, and will probably bring with them a whole new set of problems of interpretation and design. Nevertheless, to continue any longer with models which have outlived their usefulness seems as foolish as to abandon any attempts at resolution of the problem whatsoever.

SUMMARY

This paper presents a review of research in reading retardation, considering primarily American investigations. It concentrates upon a few methodological and conceptual problems common to most past work rather than upon specific studies or specific results. Various definitions of the disorder are discussed, and their confusion in practice is seen to have led to an unjustified assumption of homogeneity in the samples studied. Possible models of the disorder are reviewed, and evidence presented which suggests the usual models are inadequate. The paper concludes with a brief introduction to the statistical problems which the new models raise.

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AUTONOMIC RESPONSES OF MALE ADOLESCENTS EXHIBITING REFRACTORY BEHAVIOUR IN SCHOOL

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INTRODUCTION

IT HAS been shown (Davies, 1969; Davies and Maliphant, 1971) that refractory adolescent boys have high scores on the Psychopathic Deviant Scale (Pd) of the Minnesota Multi-Personality Inventory (M.M.P.I.) and that early adverse experiences are more common in such a group. These findings, suggesting some similarity between psychopathic behaviour and refractoriness in normal adolescents, are explored further in this paper in relation to autonomic activity.

Lykken (1957) has demonstrated that psychopathic criminals show significantly less change in skin conductance than non-psychopathic control subjects when exposed to unavoidable shock. Tong (1962) found that G.S.R. (galvanic skin response) lability is inversely related to reconviction rates amongst hospitalized psychopathic criminals. Lippert and Senter (1966), in a study of psychopathic and non-psychopathic adolescent delinquents, also report smaller and less frequent G.S.R.s in the psychopathic group when under threat of shock. Other investigations have reported that the mean resting skin conductance in psychopaths is relatively low (Walton, 1960; Claridge and Herrington, 1963; Hare, 1965a, c). Hare (1965b) reports smaller increases among students scoring high on the Pd Scale of the M.M.P.I., than those with low scores, during a period of anticipating unavoidable electric shock. Schacter and Latané (1964) suggest that the ANS (autonomic nervous system) of psychopaths differs in certain ways from those of normals. Following an injection of adrenalin, the heart-rate of psychopaths showed a significant elevation when compared with the rates of non-criminal control subjects. Such results could be construed perhaps as suggesting that psychopaths have not been accustomed to metabolizing such amounts of adrenalin and hence over-react to its presence.

Laycock (1968) found that the systolic blood pressure of juvenile delinquents changed less during a stressful task (i.e. mirror tracing under competitive conditions) than in a control group. It was pointed out that such changes in autonomic activity may be at least in part a function of base-line characteristics which were not known at the time. However, the indications are that the delinquents showed less reaction to stress.

Hare (1965b) compared students with high (mean 26·0) and low (mean 13·0) scores on the Pd Scale of the M.M.P.I. with respect to G.S.R. changes during exposure to imminent shock. The change in skin conductance was slower, more delayed and less marked among those with high scores, resembling the response of psychopaths in another study (Hare, 1965c). This finding suggests that autonomic

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characteristics, typical of psychopaths, exist in the normal population and can be detected by the Pd Scale as other studies have shown (Davies and Maliphant, 1970). On the basis of this evidence, an investigation of the autonomic characteristics of refractory children seemed appropriate.

The following general predictions were made:

1. Refractory subjects will have a lower base level of autonomic activity than non-refractory subjects.
2. Refractory subjects will show less autonomic reactivity on exposure to aversive or stressful stimuli than normal subjects.

Although it cannot be assumed that one type of response will reflect similar behaviour in other subsystems of the ANS, there are grounds for assuming this may be true (Lazarus *et al.*, 1963). In this study, it was decided to use heart-rate as the dependent variable for these reasons:

1. Measurement of heart-rate requires relatively simple apparatus which is also acceptable to children.
2. In an elaborate and thrice replicated study of autonomic balance in school children (Wenger and Ellington, 1943), it was found that heart-rate (or heart-rate period—a measure derived from heart-rate for statistical purposes) received the most weight of the seven measures contributing to an Autonomic Factor.
3. Differences in heart-rate characteristics of psychopaths and normal subjects in an avoidance learning situation (Schacter and Latané, 1964) appeared particularly relevant to the behaviour of refractory children as previously described (Davies and Maliphant, 1970).
4. Heart-rates measures, as an index of tension or fear, have good face validity.
5. In spite of the recent increase in studies utilizing heart-rate data, little is reported of studies relating such measures to individual differences (Duffy, 1962) in either personality characteristics or specific forms of behaviour, and particularly so for children.

CONSIDERATIONS ON THE MEASUREMENT OF HEART-RATE

Although heart-rate (H.R.) is relatively simple to measure and record, there are a large number of variables which may arbitrarily effect its measurement. These include age, physical fitness, thyroid state, body temperature, mood, posture, respiration, fatigue, blood-pressure, ingestion of food, tobacco and caffeine (Prout, 1968). Repeated measures from the same subject at fixed times over a period can help minimize such effects.

In this investigation, the following assumptions were made:

1. Measurement over time minimized respiration errors.
2. The effects of fatigue and the ingestion of food have been controlled by randomizing the order in which subjects were used during the day.
3. Posture was standardized as far as possible.
4. A matched pairs design ensured comparability of ages in both experimental and control subjects. Although age differences in heart-rate are recognized, normative data for children is surprisingly lacking. Cureton *et al.* (1964) have obtained heart-rate data from children aged 7–13 which indicated a drop in

the resting rate of about 1 or 2 beats per min for each additional year of age.

5. No control over smoking habits was feasible but a preliminary investigation (Davies, 1969) found that a refractory group had a significantly higher proportion of heavy smokers, as assessed by their peers, than non-refractory subjects. This would be predicted from what is known of the personality characteristics of this type of boy (Stott, 1963; Petrie, 1967). Since smoking raises the heart-rate, the possibility of finding significant heart-rate differences is thereby reduced.
6. The relationship of physical fitness to general cardiovascular efficiency is by no means clear (Cureton *et al.*, 1964). A lower resting heart-rate is also not an invariable concomitant of increased cardiovascular efficiency. Cureton's reports unfortunately give neither statistical data nor clear descriptions of the procedure used in obtaining heart-rate data. It is assumed here that the heart-rate data obtained from a cross-section of a school community is likely to be minimally influenced, if at all, by individual differences in physical fitness.

A further problem in using heart-rate as a measure is the evaluation of changes contingent upon the presentation of noxious or other stimuli. For example, an increase of 20 beats per min from a base-line rate of 60 beats per min may have different implications when compared with an increase of 20 beats per min on a base rate of 90 beats per min.

Lacey and Lacey (1962) and Hord *et al.* (1964) have found that the heart-rate—but not all autonomic measures—appears to obey the Law of Initial Value (LIV) as Wilder (1957) called it. They conclude that the post-stimulus rate is determined not only by the strength of the stimulus but also by the pre-stimulus level of activity. It would be predicted, therefore, that a given stimulus will lead to a relatively large increase in heart-rate in those with a low pre-stimulus level, by comparison with those whose response rate is initially high. Consequently, the higher the resting heart-rate, the greater is the significance of any increase in rate. Since it transpires that the resting heart-rate of refractory subjects is significantly lower, this issue is particularly important for the evaluation of the increase in heart-rate in this investigation. Support for the hypothesis that the experimental subjects are less autonomically aroused by threatening stimuli is obtained if the increases shown by this group are significantly less than those of the control group. The following transformation of the raw data was therefore made. A base heart-rate (BHR), to be described later, was obtained for each subject under neutral conditions together with his maximum heart-rate (MHR), the highest rate obtained by a subject at any point during the experiment. This data was then treated by the simple formula:

$$\frac{(\mathrm{MHR} - \mathrm{BHR})}{\mathrm{BHR}} \times 100.$$

It should be borne in mind, however, that all the evidence that can be found pertinent to this issue suggests that far from giving greater weight to increases in the lower heart-rate range (typical of the experimental subject here), greater weighting should be given to increases in the higher ranges, even though they may be much smaller.

EXPERIMENTAL DESIGN AND STATISTICAL TREATMENT OF DATA

A matched pairs design was used to control for age effects on heart-rate (Cureton, 1964). Furthermore, matching by age and class or form was likely to reduce substantially the possibility of extrinsic factors, such as physical activity and food ingestion, exerting bias in any one direction.

Since the nature of the distribution of base heart-rates is not known, nonparametric techniques were used to analyse the data. The Wilcoxon Matched Pairs Signed Rank Test (Mosteller and Bush, 1954; Siegel, 1956) was used where possible and the Mann Whitney '*u*' Test (Siegel, 1956; Wilcoxon, 1943) when it was not possible to carry out matching beforehand.

1. THE ASSESSMENT OF BASE HEART-RATE (BHR)

Subjects

Thirty subjects were selected from the pool of refractory subjects at a boarding school (Davies and Maliphant, 1970), who had been judged "refractory" by two-thirds or more of the teaching staff to whom they were well known (at least six teachers rated each subject). Each subject was matched with a control of the same age and educational level. A small intermediary group, rated as refractory by more than one teacher but by less than two-thirds of the staff, was also included.

Procedure

The base heart-rate of each subject was derived from the average of 12 1-min readings (using a Pulsemeter) taken over four occasions as widely spread as possible over the day. Subjects were seated in an upright chair so that posture was constant as far as possible and the pulsemeter was clipped painlessly to the ear lobe. Subjects rested in this position for two minutes to minimize any effect of recent activity prior to each set of three readings being taken.

Results and discussion

The difference between the base heart-rate of refractory and non-refractory subjects was significant (Table 1, $p < 0{\cdot}005$).

However, these results could mean that the BHR of non-refractory subjects was elevated above normal levels by the conditions of the investigation and not that the BHR of refractory subjects is low. Comparisons with Cureton's (1964) findings are of limited value because of differences in the age range of the samples. However,

TABLE 1. MEAN BASE HEART-RATES (BHR) OF REFRACTORY AND NON-REFRACTORY SUBJECTS

	N	BHR	S.D.	Range
Refractory group	30	75·6	5·9	63·7– 87·0
Non-refractory group	30	84·2*	6·0	71·5–100·3
Intermediate group	8	78·5	8·4	59·0– 92·3

*Difference between the means of the refractory and non-refractory group significant at $p < 0{\cdot}005$ (Wilcoxon Test).

TABLE 2. COMPARISON OF MEAN B.H.R. OF CURETON'S (1964) SUBJECTS WITH THOSE OF REFRACTORY AND NON-REFRACTORY SUBJECTS

Mean age (yr)	Cureton's sample	S.D.	Non-refractory subjects	S.D.	Refractory subjects	S.D.
12·0	84·0 ($n = 22$)	8·9	88·6 ($n = 9$)	5·9	78·2 ($n = 9$)	6·45
13·0	81·0 ($n = 15$)	13·3	83·0 ($n = 7$)	9·7	75·3 ($n = 7$)	8·5
14–16	—	—	81·2 ($n = 14$)	5·3	73·8 ($n = 14$)	7·6

it will be seen (Table 2) that for comparably aged subjects, the BHR of the refractory group is in fact substantially lower and the controls slightly higher than Cureton's sample. This at least suggests that the BHR of the refractory subjects is probably the more atypical.

The differences in BHR of the two groups is also indicated in Fig. 1.

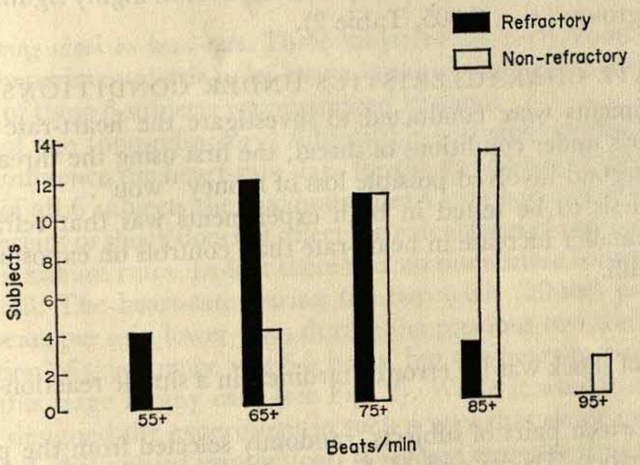

FIG. 1. Distribution of base heart-rates. $N = 30$ pairs.

As a check on subjects' reaction to the experimental situation, a running average of the heart-rates of the first 12 subjects recorded (6 refractory and 6 non-refractory) was plotted. Both groups showed a marked elevation on the first occasion (Table 3), but by the third occasion the mean heart-rate for both groups had flattened out.

TABLE 3. MEAN H.R. OF REFRACTORY AND NON-REFRACTORY SUBJECTS DURING THE FIRST EIGHT RECORDINGS OF HEART-RATE

Subjects	Recordings							
	1	2	3	4	5	6	7	8
Non-refractory ($n = 6$)	100	82	80	86	82	86	80	84
Refractory ($n = 6$)	81	64	73	76	74	76	75	74

(H.R. in beats per minute)

These results suggest that refractory boys do tend to have lower base heart-rates than others. While it would be premature, at this stage, to suggest how far knowledge of BHR could be used to select children who may present difficulties in behaviour and who may also be more responsive to different régimes of management, the data is sufficiently suggestive to encourage a more extensive replication with both normal and delinquent children. It would also be important to investigate how early in life such heart-rate characteristics are determined. It is well known that neonates differ in heart-rate and other autonomic characteristics (Lipton *et al.*, 1961; Clifton and Graham, 1968). Could it be verified, for example, that institutionalization or traumatic separations do evoke changes in autonomic characteristics as Levine's (1956) evidence suggests is true for animals, then it might be possible to provide much more selective and appropriate forms of treatment for such children. However, even assuming strong confirmation of the hypotheses underlying these speculations, marked individual differences will still have to be contended with (Walton, 1960; Hare, 1960; Claridge *et al.*, 1963). In the group tested, 11 out of 30 matched pairs of subjects had similar base heart-rates (Fig. 1) in spite of the overall highly significant difference between these groups ($p < 0{\cdot}005$, Table 2).

2. HEART RATE CHARACTERISTICS UNDER CONDITIONS OF THREAT

Two experiments were conducted to investigate the heart-rate characteristics of refractory boys under conditions of threat, the first using the threat of an electric shock and the second involved possible loss of money "won".

The hypothesis to be tested in both experiments was that refractory subjects would show a smaller increase in heart-rate than controls on exposure to the threat of noxious stimuli.

Experiment 1

The threat of shock was for error or tardiness in a simple reaction-time task.

Subjects. Fourteen pairs of subjects, randomly selected from the pool of subjects previously described (Davies and Maliphant, 1970), were used. The matching was carried out independently by a senior member of staff and checked by two others. There were no disagreements in the allocation of boys to the two groups, refractory and non-refractory.

Procedure. The conditions of the experiment were explained to the boys, who were given the opportunity to opt out—only one did so.

The subjects attended individually and were seated in front of a display containing a red and green light horizontally mounted. They were required to place the first finger of each hand on a morse key. It was explained that they would be required to lift the left finger if the red light came on and the right finger if the green light came on during the experiment.

The pulsemeter was clipped to the subject's ear so enabling constant monitoring of the heart-rate.

The subjects were told that the time they took lifting the appropriate finger from the key would be recorded (using a chronotron) and that they would receive rewards of twopence, a penny, or nothing, dependent on how quick they were.

A prearranged order of presentation of lights was used for both sets of 20 trials with all subjects. Equal numbers of red and green were presented randomly for 20 trials. The experimenter recorded the subject's reaction time on each trial, reset the chronotron and operated the relevant key. These operations were performed behind a 2 ft × 2 ft vertical screen and could not be observed by the subject.

On completion of 20 trials the subjects were then told they had earned 1/5d, 1/6d, or 1/7d (the sum was allocated randomly).

The subject was then warned that he would receive a strong electric shock in the second part of the experiment if he lifted the wrong key or if he took too long.

Twenty further trials under this "stress" condition were then run. The majority of subjects did not, in fact, make any errors, though their reaction times increased. Unless it was seen that it must be obvious to subjects that their times were much slower than before (viz. if it increased by more than 25% over the mean of the first 20 trials) this was ignored; if it seemed obvious then the experimenter warned the subject.

After these 20 trials the subject's heart-rate was monitored for a further 3 min. The figure recorded was the heart-rate indicated on the dial of the pulsemeter every 30 sec. Hence 6 post-trial readings were obtained.

The aim of this experiment was to provoke as much fear in the subject, but not so much as to deter him from participating.*

A few subjects made more than one error. The first was always overlooked but the second error was accompanied by a warning. This occurred with 6 of the 28 subjects—3 from each group. If a further error was made shock was given.

Effect of receiving shock on heart-rate. Three subjects from each group received shock during the 20 experimental trials, in every instance during the last 5 trials. The heart-rate data of these 6 subjects was examined in detail.

In the case of one (non-refractory) subject this occurred on the final trial and hence does not influence the heart-rate data for the experimental period.

In the case of all 6 subjects the maximum heart-rate had already been attained and hence the receipt of shock does not affect the calculation of heart-rate responsiveness based on maximum rates. In fact there was no discernible consistency of heart-rate change at all. The heart-rate during the two trials (20 sec) period following shock was 1·5 beats per min lower than during the previous two trials although the standard deviation of this change was 6·5 beats, but the heart-rate of most subjects was falling by this stage in any case (see Fig. 2). While it would have been satisfactory to have designed the experiment in such a way that shock need never have been administered, this proved impractical. It seemed essential that subjects should believe that threats of shock were genuine if the heart-rate changes were to be meaningfully evaluated. If it became apparent that the threat was without substance this news might have spread through the boarding school community and influenced both this and other experiments. It was felt that omitting shock on the first two occasions that error was made was taking as great a chance in this respect as was reasonable.

It is concluded that the receipt of shock by 6 subjects did not alter the general findings of this experiment.

Results. Reactivity of heart-rate was calculated from the maximum percentage increase in heart-rate that exposure to the experimental situation provoked.

The hypothesis that the heart-rate of refractory subjects is less affected by exposure to threat is supported (Table 4).

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*One subject from the control group opted out of the experiment at this point. His heart-rate had already been higher than any of the other subjects from either group. The omittance of his heart-rate data from the analysis reduces slightly the difference between the groups (Fig. 2).

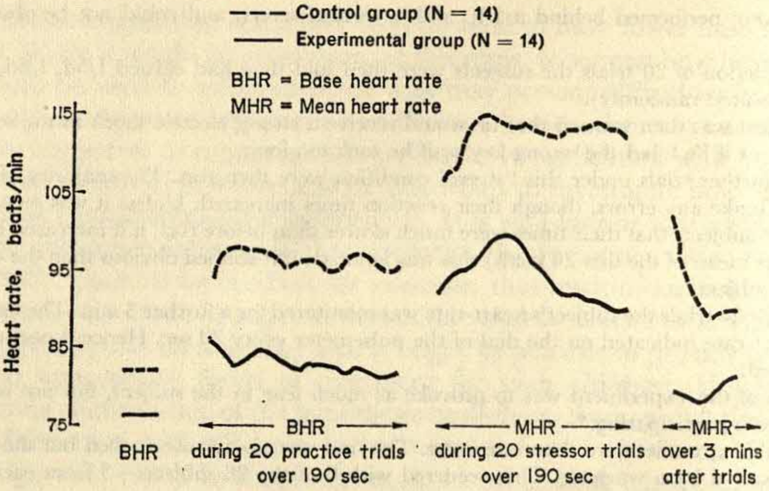

FIG. 2. Experiment 1: Heart-rate changes (Boarding School sample).

Figure 2 shows the smoothed average heart-rate of refractory and non-refractory subjects throughout the experimental procedure. The heart-rate was also recorded at 30 sec intervals for 3 min at the conclusion of the experiment.

It will be seen that the heart-rate of refractory subjects not only shows a significantly lower base-rate, but a briefer and significantly less extreme elevation during the experiment. The heart-rate characteristics are reminiscent of the skin conductance characteristics of Hare's (1965c) psychopathic subjects, and his students with high Pd Scores (Hare 1965b) when exposed to unavoidable shock, and hence supports the view that in refractory as in psychopathic subjects, autonomic reactivity is relatively low.

Experiment 2

A similar procedure was followed as outlined in Experiment 1 except that instead of the threat of shock, fining was used as a punishment for error. Thus, the noxious stimulus was of a different nature and considered less stressful.

Subjects. In this experiment, a different sample of boys was used. They were aged 12 to 16 yr and attended a large mixed day secondary school. Unlike the first experiment they were not known to the experimenter. Furthermore, the experimenter did not know at the time whether a subject was considered refractory or not. This limited the chance of any specific experimenter effects operating (Rosenthal and Fode, 1963; Rosenthal, 1966).

Thirty-three subjects were randomly selected for the experiment. Attempts to obtain teachers' ratings, as in previous experiments, were unsuccessful. After the experiment two teachers completed a proforma, designed by Davies (1969)—see Appendix—to sample five traits, using a four-point scale for each. A refractoriness score was calculated by simply summing the ratings for each trait, making the range of scores 5–20 for each boy, based on one teacher's ratings, or 10–40 using both. The

TABLE 4. INCREASE IN HEART-RATE OF REFRACTORY AND NON-REFRACTORY SUBJECTS DURING EXPERIMENT 1

	Mean BHR	S.D.	Mean MHR	S.D.	Increase (MHR—BHR)	S.D.	$\frac{\text{MHR}-\text{BHR}}{\text{BHR}} \times 100$	S.D.
Refractory subjects ($N = 14$)	76·4	8·2	106·2*	15·8	29·8	14·1	38·03†	21·0
Non-refractory subjects ($N = 14$)	82·6	8·3	120·4*	38·4	37·8	21·1	60·7†	31·5

*Difference in M.H.R. is significant. $p < 0{\cdot}005$ (Wilcoxon Test for Matched Pairs).

†Difference in increase per cent significant. $p < 0{\cdot}005$ (Wilcoxon Test for Matched Pairs).

actual scores obtained ranged from 12 to 37. To maximize the opportunity for differences to be demonstrated, the heart-rates of 7 boys scoring at the two extremes of this range were compared. A further 7 subjects were selected as close to the median scores as possible to serve as an intermediate group. Since it was not possible to get base heart-rate data from these boys, as they returned home after school, comparisons were made between the heart-rate at onset (HRO) of the experiment (viz. the mean of the first two readings) and the point at which the subject recorded his maximum heart-rate (MHR). Since it had already been established that control subjects were likely to be more reactive, in terms of increase in heart-rate, such a strategy was more likely to reduce significant differences between the groups rather than to artificially induce them.

Procedure. The instructions given for the first part of the experiment, the 20 practice trials, were the same as in Experiment 1. On completion of these, the experimenter randomly allocated rewards to subjects of 1/5d, 1/6d or 1/7d and a shilling for their co-operation.

For the second stage of the experiment, the subjects were told that if they made a mistake or were too slow they would be fined a shilling.

Twenty further trials were then run. Once again the majority of subjects made no errors. If there was any very obvious increase in reaction time—that is more than 250 msec or so increase—the subject was warned but in any case all subjects were harassed twice during the trials in this way, irrespective of their reaction time, in an attempt to equalize the experience of exhortation. If a subject did make a mistake, the experimenter gave a warning as the next trial was due to start and fined the subject for any error thereafter. In fact, only one subject made a second error.

Before the onset of the practice trials the heart-rate was noted every 10 sec, for the 2 min period during which instructions were given. During the 40 trials, the heart-rate was monitored at the moment the subject made the response.

Results. The increase in heart-rate for the three groups is presented in Table 5 and Fig. 3.

TABLE 5. INCREASES IN HEART-RATE IN BEATS PER MINUTE (MHR—HRO)

	Mean age			
Subjects	Mean age (yr)	S.D.	Refractory mean	Score S.D.
Refractory* $n = 7$	14·1	0·68	25·0	10·8
Intermediate group $n = 7$	14·4	0·59	33·5	13·9
Non-refractory $n = 7$	14·3	0·61	39·7	11·4

*Mann Whitney 'u' Test $u = 10; p < 0{\cdot}036$.

In spite of the mild nature of the threat and the use of heart-rate at onset (HRO) instead of base heart-rate (BHR), the difference between the refractory and non-refractory group was significant ($p < 0{\cdot}036$), thus supporting the hypothesis.

An analysis of the errors committed by the three groups, however, revealed no significant differences although the refractory group did tend to commit more than the others.

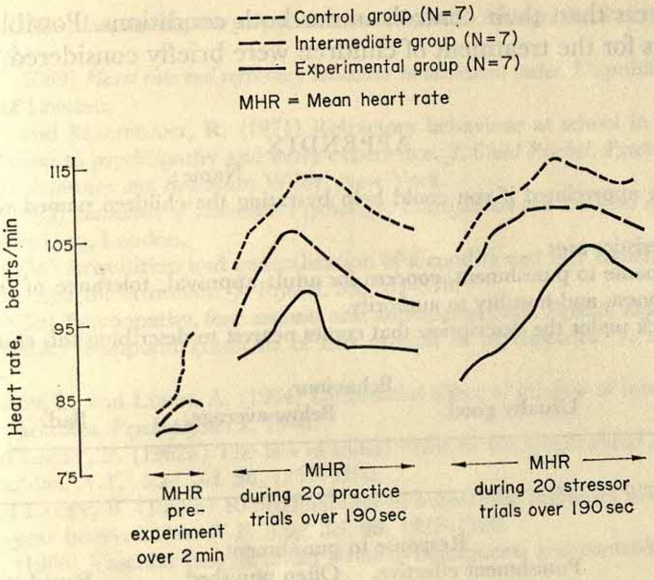

FIG. 3. Experiment 2: Heart-rate changes (Day School sample).

DISCUSSION

Although the selection of subjects and the design of Experiment 2 has defects largely as a result of conditions beyond the experimenter's control, the results of both the experiments agree closely, in spite of the differences in the degree of "threat" and the absence of base line heart-rate data in Experiment 2. In both experiments the heart-rate reactivity was consistently lower for the refractory group. Figures 2 and 3 reveal the marked similarities in the heart-rate characteristics of both groups of subjects exposed to different forms of aversive stimuli. The general differences in heart-rates in Experiments 1 and 2 could be due in part to the measure of familiarity between the experimenter and the subjects used in Experiment 1, with the result that "stress" in the 20 "practice" trials would be lowered. In Experiment 2, the experimenter was a complete stranger in the school and the boys were without any previous experience as experimental subjects. This may account for the rather higher rates in these groups.

In these two experiments, refractory subjects tended to be less reactive to stress conditions and to have lower base heart-rates or lower heart-rates at the onset of the experiment. Further investigations are planned to explore further the relationship of personality characteristics to variation in heart-rate. It is hope also to investigate the behaviour of both delinquents and deprived children in this way.

SUMMARY

Adolescent boys, judged by the majority of their teachers to be refractory, were found to have significantly lower base heart-rates than their matched controls.

Two supplementary experiments, using a simple reaction-time design but with the subjects experiencing different degrees of threat or stress, supported this general finding. Autonomic reactivity, as measured by changes in heart-rate, was less for

refractory subjects than their controls under both conditions. Possible implications of these findings for the treatment of children were briefly considered.

APPENDIX

Name:

It would be much appreciated if you could help by rating the children named with respect to 5 characteristics.

These characteristics are:

Behaviour, response to punishment, concern for adult approval, tolerance of temptations to be aggressive or dishonest, and hostility to authority.

Please put a tick under the description that comes nearest to describing this child.

Behaviour

Excellent.	Usually good.	Below average.	Bad.

Response to punishment

Threats sufficient to deter.	Punishment effective.	Often punished.	Punishment seems ineffective.

Concern for adult approval

Badly needs approval.	Normal need to be thought well off.	Doesn't care much what adults think.	Quite indifferent to disapproval.

Ability to resist temptations of dishonesty and aggression

Excellent self-control. Can be trusted.	Normal response to temptations. Can generally be trusted.	Liable to give way to impulse.	Little self-control over antisocial impulses.

Hostility to authority

Good, trusting relationships with authority.	No obvious dislike of authority.	Rather anti-authority.	Dislikes, distrusts, resents authority.

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ATTENTION IN HYPERACTIVE CHILDREN AND THE EFFECT OF METHYLPHENIDATE (RITALIN)*

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CHILDREN are frequently described as overactive, particularly by parents and teachers. Lapouse and Monk (1958) estimated that some 50 per cent of all children between the ages of 6 and 12 yr are described by their mothers as highly active although their activity is not necessarily a problem. Stewart *et al.* (1966) have estimated that 4 per cent of all school-age children show a level of activity sufficiently excessive and sustained as to be a serious source of complaint at both home and school. Such children have been labelled "hyperactive" by clinicians.

Given the problems surrounding the definition and measurement of activity level, particularly in humans (Cromwell, Baumeister and Hawkins, 1963), it is by no means surprising that there is little agreement on the definition of hyperactivity. For some investigators it implies a greater quantity of movement (Schulman, Kaspar and Throne, 1965), but this has been questioned by others (Werry and Sprague, 1970). Cromwell *et al.* (1963) have suggested that the "overactivity" of "hyperactive" children may be a reflection of the short attention span and rapidly changing goal directions of such children. Thus, these investigators argue that hyperactive children may be thought of as children whose behaviour is fragmented or disorganized and continually changing direction such that an impression of a high level of activity is created.

Certainly, the inability of hyperactive children to maintain their attention to a task has frequently been remarked in the clinical literature. However, other than the clinical statements and the remarks of teachers and parents, there are few experimental studies which clearly show an attentional deficit in such children. In fact, there is no reliable evidence that they are impaired on the usual tests of attention, such as the coding subtest of the Wechsler Intelligence Scale for Children (Douglas, Weiss and Minde, 1969). It has been suggested with respect to this latter test, that if the attentional impairment took the form of brief lapses in attention, then performance on the coding test need not necessarily be impaired. The nature of the

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coding test is such as to allow the subject to compensate for any brief lapses by working rapidly in between lapses (Rosvold *et al.*, 1956). In contrast, impaired performance due to momentary lapses in attention should be noted on a task in which the arrival of significant information is unpredictable. A task designed to meet these requirements was constructed by Rosvold *et al.* (1956), namely the Continuous Performance Test.

This task requires the subject to monitor a screen on which letters appear at regular intervals and to make a response whenever a previously specified stimulus appears. The test is similar to many of the tasks used in vigilance studies. Any momentary lapse in attention which is coincident with the appearance of a significant stimulus would appear as an error of omission. Thus, the primary purpose of the present study was to examine the performance of a group of hyperactive children relative to the performance of a group of normal control children on a task susceptible to momentary lapses in attention.

It has been observed that motor restlessness in adults increases with time on a vigilance task (Baker, 1960), although no relationship was found between actual performance on the task and the increase in restlessness. In the present study the motor restlessness of hyperactive and normal children while seated during the attention task was also examined, using a stabilimetric cushion after the design of Sprague and Toppe (1966).

The third purpose of the study was to investigate the effect of methylphenidate (Ritalin), a central nervous system stimulant, on attention in hyperactive children. A number of investigators have found this drug particularly efficacious in the treatment of hyperactive children (Campbell, Douglas and Morgenstern, 1969; Cohen, Douglas and Morgernstern, 1969; Conners, Eisenberg and Sharpe, 1964; Douglas *et al.*, 1969; Eisenberg, Conners and Sharpe, 1965; Knights and Hinton, 1969; Sprague, Barnes and Werry, 1970; Weiss *et al.*, 1970). However, there is still some question as to its specific effects on sustained attention in hyperactive children (Conners *et al.*, 1964).

METHOD

Subjects

Since the reliable and valid measurement of activity has proved to be a difficult task (Cromwell, Baumeister and Hawkins, 1963), no exact definition of "hyperactive child" in terms of a measured quantity of movement or activity has yet been made. Consequently, the definition of such children in the present study was an operational one based on the selection criteria used. For a child to be included in the study, hyperactivity had to be the major complaint. That is, both the child's parents and teacher had to specify the overactivity of the child as their major complaint and the reason for the referral. Furthermore, such hyperactivity had to have been present as a chronic problem since early childhood and be sustained throughout the day. To ensure as homogeneous a group as possible, children diagnosed by the child psychiatrists as psychotic, epileptic or brain-damaged, or whose major-presenting symptom was behaviour disturbance of an emotional nature, were excluded from the study.

Forty children (34 males and 6 females) who met the above criteria were included in the study. The ages of the *Ss* ranged from 5 to 12 yr (mean age = 8 yr; *s.d.* = 1 yr 9 months) and their intelligence quotients (as measured by the Wechsler Intelligence Scale for Children (Wechsler, 1949)) were not less than 80 (mean *I.Q.* = 111; *s.d.* = 11).

A control group of 19 normal children, matched for age, sex and *I.Q.* with 19 of the hyperactive children, was also tested. The two groups did not differ on mean age ($t = 0{\cdot}003$, $df = 18$, *NS*) or *I.Q.* ($t = 0{\cdot}018$, $df = 18$, *NS*). The control children were selected from the normal school population of the City of Montreal.

All of the children were English speaking, living at home with at least one parent and were attending regular school classes.

Measures

Attention task. The Continuous Performance Test (C.P.T.) is an experimenter-paced task, that is *E* controls the arrival and duration of the task stimuli. A series of letters are presented one at a time on a screen. *S* is required to monitor the screen and respond whenever a specified stimulus, the significant stimulus, appears. Three variables were manipulated in the present study, namely task stimuli, distraction and interstimulus interval.

There were three separate series of task stimuli, referred to as the *X* the *AX* and the Form sequences. These task stimuli differed in the following respects. In the *X* sequence 12 letters appeared on the screen in a random serial order, the letter *X* being the significant stimulus to which *S* had to respond. In the *AX* sequence the same 12 letters as in the *X* sequence were used, but here the significant stimulus to which *S* responded was the letter *X* only when it was immediately preceded by the letter *A*. The stimuli for the Form sequence consisted of seven geometric shapes in one of five colours. The significant stimulus to which *S* was required to respond was a red triangle.

Each of the three sequences (*X*, *AX* and Form) were presented under two conditions of distraction, minimal and intermittent noise. In the minimal condition *S*'s room was kept as free as possible of extraneous distracting noise. In the intermittent condition white noise (80 decibels) was piped into *S*'s room at frequent random intervals.

Each of the three sequences was displayed at two interstimulus intervals, 1·0 and 1·5 sec. Thus, for both groups of *Ss* there were three sequences (*X*, *AX* and Form), two distraction conditions (minimal and intermittent noise) and two inter-stimulus intervals (1·0 and 1·5 sec), making 12 trials in all for each *S* (i.e. a four-way complete factorial design).

On each of the 12 trials a total of 200 stimuli were presented. Thus, at the 1·0 sec interstimulus interval a trial was continuous for 3·3 min and at the 1·5 sec interstimulus interval for 5 min.

Motor restlessness. Restlessness while seated was measured with a stabilimetric cushion (Sprague *et al.*, 1966). Movements of the *S* on the seat in the left–right and front–back directions activated microswitches placed underneath the cushion. The microswitches were connected to digital counters which gave a total score based on the movements of the *S* in all directions.

Procedure

All *S*s were tested individually. Each *S* visited the hospital on two occasions to complete the initial (pre-drug) testing. During the first session 6 of the 12 trials were given, the remaining 6 trials being given during the second session. The trials were randomized such that order effects were controlled. During the actual testing *S* was alone in the test room, while *E* was in an adjoining room monitoring the equipment and *S*'s behaviour through a one-way screen.

Upon completion of the initial testing each of the 40 hyperactive children was assigned, using a randomized code provided by the Ciba Pharmaceutical Company, to one of two groups, Active Drug or Placebo, using the double-blind technique. The two psychiatrists then titrated the drug for each of their patients until the optimum clinical effect, based on the parents' report of the child's behaviour and the psychiatrist's evaluation of that report, was reached. For most of the children, this optimum clinical effect was reached when the dosage was in the region of 30–40 mg per day. Each hyperactive child returned for retesting (again for two sessions) while on either the active drug or a placebo, 5–7 weeks after completion of the initial testing. The code was not broken until on-drug testing was completed. The control *S*s were seen only for the initial testing (i.e. for only two of the four sessions).

RESULTS

On the C.P.T. there were two dependent measures, the absolute score and the error score. The absolute score is a measure of the *S*s accuracy in detecting the significant stimuli (i.e. No. correct responses/Total no. significant stimuli presented × 100) and the error score is the number of responses to non-significant stimuli.

Hyperactive-control comparisons

Two separate four-way analyses of variance, repeated measures design (Winer, 1962) were used to compare the absolute scores (Table 1a) and the error scores (Table 1b) of the hyperactive and normal children. The four factors were, (1) Groups—hyperactive vs. control, (2) Sequence—X, *AX* and Form, (3) Interstimulus interval—1·0 sec vs. 1·5 sec, and (4) Distraction—noise vs. no noise.

A significant Groups factor ($p < 0{\cdot}025$) was obtained when the absolute but not the error scores were analysed. This finding indicated that the hyperactive children made significantly fewer correct responses than did the control children (mean hyperactive group = 75·54 per cent, mean control group = 84·49 per cent). However, the groups did not differ with respect to overall number of errors (mean hyperactive group = 6·69, mean control group = 6·12).

Two other main factors were also found to be significant, namely Interstimulus Interval and Sequence. The significant interval factor indicated that both groups of children (hyperactive and control) made more correct responses and fewer errors when the slow (1·5 sec) rather than the fast (1·0 sec) interstimulus interval was used (1·5 sec interval: mean correct both groups = 85 per cent, mean errors = 5·57: 1·0 sec interval: mean correct = 74·5 per cent, mean errors = 7·73).

A main effect for Sequence was found only when absolute scores were analysed and indicated that both groups of children made more correct responses for the X

Table 1. Two four-way analyses of variance (repeated measures) of the absolute and error scores obtained by hyperactive and normal children on the continuous performance test

Source		(1a) Absolute score			(1b) Error score		
	df	*MS*	*F*	*p*	*MS*	*F*	*p*
Between *Ss*							
Groups	1	9126·32	6·76	< 0·025	37·06	0·25	
S (within groups)	36	1350·33			147·80		
Within *Ss*							
Sequence	2	903·37	3·64	< 0·05	32·00	1·21	
Groups × sequence	2	363·14			25·04	0·95	
Sequence *S* (within groups)	72	247·95			26·35		
Distraction	1	1·98			8·98	1·30	
Groups × distraction	1	3·51			0·71	0·10	
Distraction *S* (within groups)	36	35·66			6·93		
Interstimulus interval	1	13882·15	158·14	< 0·005	313·34	20·39	< 0·005
Groups × interval	1	0·00			130·56	8·49	< 0·01
Interval *S* (within groups)	36	87·78			15·37		
Sequence × distraction	2	6·64			10·86	1·55	
Groups × sequence × distraction	2	22·40			14·42	2·06	
Sequence × distraction *S* (within groups)	72	33·44			7·01		
Sequence × interval	2	318·03	3·96	< 0·025	15·13	0·92	
Groups × sequence × interval	2	97·65			1·23	0·08	
Sequence × interval *S* (within groups)	72	80·22			16·37		
Distraction × interval	1	94·87			0·43	0·04	
Groups × distraction × interval	1	72·64			0·00	0·00	
Distraction × interval *S* (within groups)	36	49·88			10·25		
Sequence × distraction × interval	2	27·52			1·49	0·19	
Groups × sequence × distraction × interval	2	43·24			0·60	0·08	
Sequence × distraction × interval *S* (within groups)	72	54·83			7·72		

(mean = 82·29 per cent) than for the Form (mean = 80·31 per cent) and *AX* (mean = 77·44 per cent) sequences respectively. Mean errors did not differ significantly across the three sequences (mean *X* sequence = 6·74, mean Form sequence = 5·88, mean *AX* sequence = 6·59).

The main effect for Distraction did not reach significance when either absolute or error scores were anlysed. Thus it may be concluded that the distraction factor did not produce any significant decrement in the C.P.T. performance of either group.

Only two interactions reached significance, Groups by Interstimulus Interval (for error scores only) and Sequence by Interstimulus Interval (absolute scores only). The Groups by Interval Interaction is represented in Fig. 1, and indicates that although the hyperactive and control children made a similar number of errors at the fast interval (1·0 sec), the control children made significantly fewer errors at the slower interval (1·5 sec) than the hyperactive children.

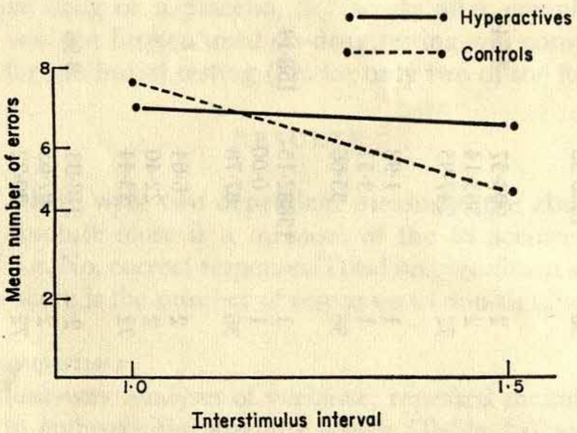

FIG. 1. Incidence of errors on the continuous performance test of the hyperactive and control groups at two interstimulus intervals.

The significant Sequence by Interval interaction indicated that the difficulty of the three sequences, *X*, *AX*, and Form depended on the interstimulus interval used. For the 1·0 sec interval more correct responses were made by both groups to the *X* (mean = 78·36) than to the Form (mean = 74·46) or *AX* (mean = 70·67) sequences. When the 1·5 sec interval was used the order was Form (mean = 86·16), *AX* (84·21) and *X* (82·22).

Motor restlessness

The total activity scores for each *S* accumulated during each of the two testing sessions were first transformed to logarithms to reduce the large variation between *S*s (Winer, 1962) and then analysed by means of a two-way analysis of variance, repeated measures design. The two factors were Groups (hyperactive vs. control) and Session (1st vs. 2nd visit).

The hyperactive children accumulated significantly greater activity scores than the control children (F for groups $= 6{\cdot}84$, $df = 1/36$, $p < 0{\cdot}05$). The main effect for sessions also reached significance, indicating that for both groups restlessness increased during the second session ($F = 192{\cdot}27$, $df = 1/36$, $p < 0{\cdot}001$). Moreover, the significant Groups by Session interaction ($F = 7{\cdot}81$, $df = 1/36$, $p < 0{\cdot}01$) indicated that the restlessness of the hyperactive children increased at a faster rate from the 1st to the 2nd session than did that of the control children (Fig. 2).

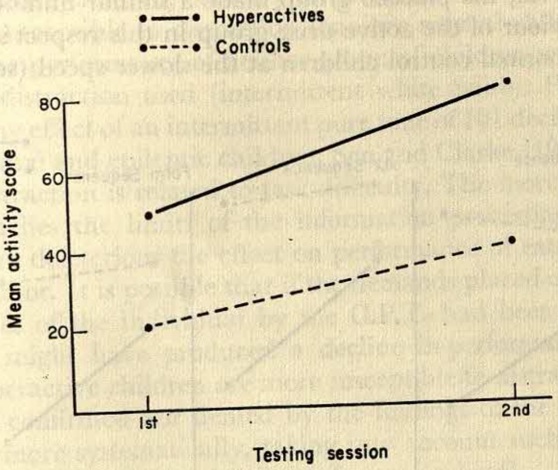

FIG. 2. Restlessness scores of hyperactive and control children during two testing sessions.

Drug comparisons

Despite the fact that the hyperactive children were randomly assigned to either the Active Drug or Placebo group ($N = 20$ per group) and a double-blind technique was used, it was found that those hyperactive children receiving the active drug had actually obtained poorer pre-drug C.P.T. scores than had those placed on a placebo. Consequently, it was necessary to use analyses of covariance (covarying for initial C.P.T. performance) on both absolute and error scores when evaluating the effect of methylphenidate compared to placebo.

Two-way analyses of covariance (Winer, 1962) were completed on each of the three task sequences (X, AX, and Form) separately. The two factors were Groups (drug vs. placebo) and Interval (1·0 sec vs. 1·5 sec). Distraction (noise vs. no noise) was not used as a main factor in these analyses since the previous analyses (Table 1A and 1B indicated that it did not affect performance.

For all three task sequences, the active drug group had a significantly higher absolute score than did the placebo group ($p < 0{\cdot}005$ in all three cases). The active drug group also made significantly fewer errors than the placebo group on the X ($p < 0{\cdot}005$) and Form ($p < 0{\cdot}05$) but not the AX sequences.

The main effect for Interval was significant for all three task sequences when absolute scores were analysed. As in the initial analyses, this finding indicated that

*S*s made more correct responses when the slow rather than the fast interstimulus interval was used. They also made fewer errors when the slow interval was used, this effect reaching significance only in the analysis of error scores on the *AX* task.

The Groups by Interval interaction was not significant in the analyses of absolute scores for any of the three tasks. When error scores were analysed, however, this interaction reached significance in the *X* condition ($p < 0{\cdot}5$) and showed a trend in the *AX* condition ($p < 0{\cdot}10$). This interaction is illustrated in Fig. 3 and indicates that whereas the active drug group made fewer errors at the slow than at the fast interstimulus interval, the placebo group made a similar number of errors at both speeds. The behaviour of the active drug group in this respect is reminiscent of the behaviour of the normal control children at the slower speed (see Fig. 1).

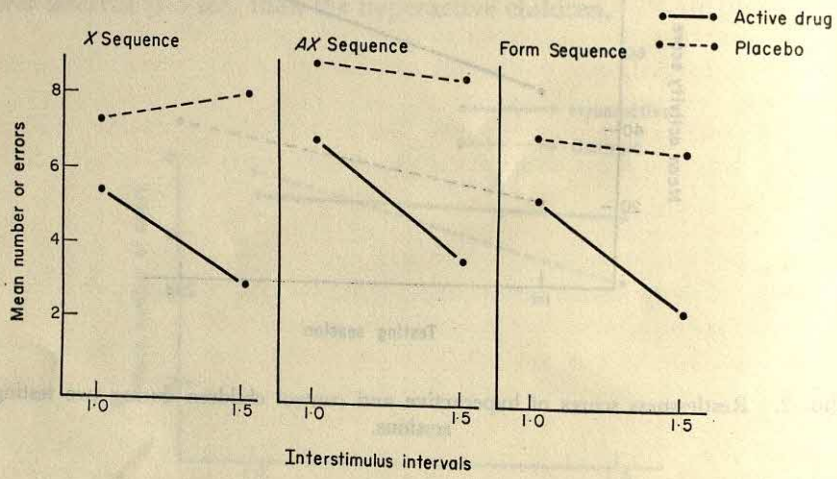

FIG. 3. Incidence of errors on the continuous performance test of the active drug and placebo groups at two interstimulus intervals.

DISCUSSION

The results of the present study lend support to the hypotheses that hyperactive children are deficient with respect to their ability to maintain attention to a task and are physically more restless than normal children.

On a three-part task (*X*, *AX* and Form) requiring the monitoring of a screen, the hyperactive children detected significantly fewer of the significant stimuli. They also made significantly more responses to non-significant stimuli than did the control children at the slow, but not at the fast interstimulus interval. It should be noted, however, that the performance of the hyperactive children was not as impaired as that of the brain-damaged and centrencephalic epileptic children studied by Rosvold *et al.* (1956) and Fedio and Mirsky (1969).

Three task variables were manipulated in an attempt to ascertain whether hyperactive and normal children would respond differently under different conditions. The three variables were (1) sequence, (2) distraction and (3) interstimulus interval.

It was found that the three sequences used did not differ in order of difficulty for the hyperactive and normal children, all subjects finding the *X* sequence easier than the Form or *AX* sequences at the slow (1·5 sec) interstimulus interval and the Form sequence easier than the *AX* or *X* sequences at the fast (1·0sec) interval (as measured by the absolute score).

Similarly, the second variable, namely distraction, did not differentially affect hyperactive and control children, contrary to the widely held view that hyperactive children are more susceptible to distraction than are normal children. The present study found that the performance of neither group of children was affected by the particular type of distraction used (intermittent white noise). Fedio *et al.* (1969) also failed to find any effect of an intermittent pure tone of 101 decibels on the C.P.T. performance of normal and epileptic children. Sen and Clarke (1968) point out that susceptibility to distraction is related to task difficulty. The more difficult the task, especially as it reaches the limits of the information processing capacity of the individual, the more deleterious the effect on performance of extraneous stimuli in the form of a distractor. It is possible that if the demands placed on the information processing capacities of the individual by the C.P.T. had been greater, then the intermittent noise might have produced a decline in performance. Certainly, the hypothesis that hyperactive children are more susceptible to distraction than normal children is neither confirmed nor denied by the findings of the present study but needs to be tested more systematically, taking into account such variables as type of distractor and level of task difficulty (i.e. information load).

The third variable manipulated, namely interstimulus interval, did affect the C.P.T. performance (error scores only) of hyperactive and normal children differentially, since normal children made significantly fewer errors than the hyperactive children when a slow (1·5 sec) rather than a fast (1·0 sec) speed of presentation was used. Since "errors" are responses to non-significant stimuli, this finding suggests that additional time between stimuli helped normal children more than hyperactive children to evaluate each stimulus more efficiently and thus to inhibit their responses to non-significant stimuli. That hyperactive children are more prone than normal children to impulsive responding is well documented (Campbell *et al.*, 1969; Cohen *et al.*, 1969; Conners and Greenfeld, 1966; Stevens *et al.*, 1968) and it would be interesting in a future study to see if an even longer interstimulus interval would help hyperactive children to make fewer errors on the C.P.T.

As expected, the hyperactive children were more restless (as measured by a stabilimetric cushion activity score) than the normal children. Also, their restlessness increased from the 1st to the 2nd testing session at a faster rate than did that of the normal children. While Cromwell *et al.* (1963) have suggested that the "hyperactivity" or restlessness of these children is a result of an inability to maintain attention, it is not yet possible to specify the cause-effect relationship, if any, between these two variables. As techniques for measuring activity or movement become more sophisticated, it may be possible to examine in detail the relationship between these behaviours.

The findings of the present study demonstrate that methylphenidate significantly improves the C.P.T. performance of hyperactive children: the hyperactive children on the active drug detected more significant stimuli and made fewer errors or (impulsive) responses to non-significant stimuli than did the hyperactive children given a placebo. In fact, the Drug Groups by Interstimulus Interval interactions obtained when *error* scores for the X ($p < 0{\cdot}05$) and AX ($p < 0{\cdot}10$) sequences were analysed suggests that the effect of the drug is to enable those taking it to make fewer errors at the slow speed compared to the fast speed of presentation of stimuli. In other words, it apparently helped the hyperactive children to evaluate the stimuli more effectively and thus to inhibit their responses to non-significant stimuli. This is in contrast to the hyperactive children given a placebo who did not show a similar reduction in errors at the slow interstimulus interval.

An important question which the present study could not answer owing to technical difficulties was whether methylphenidate reduced the physical restlessness of the hyperactive children. Such a reduction in the physical restlessness of hyperactive, emotionally disturbed boys given methylphenidate has recently been reported by Sprague *et al.* (1970). Clinical observation by the present investigators and the parents of the hyperactive children suggests that methylphenidate did reduce restlessness (as found by Knights *et al.*, 1969; Weiss *et al.*, 1970). In the light of the Cromwell *et al.* (1963) suggestion that the restlessness of hyperactive children is not mere activity *per se*, but continued shifting from task to task because of short attention span, it may be that the effect of methylphenidate is to improve the ability of hyperactive children to pay attention (as demonstrated on the C.P.T. in the present study) such that they shift less from task to task and thus appear less restless or active.

In conclusion, while the present study provides some evidence that hyperactive children are deficient with respect to sustained attention it is clear that future research must examine behaviours that are more closely related to the actual attentional demands placed on the child in the school setting. In other words, the emphasis must be on the discovery of the variables influencing attention in the school setting and on the manipulation of these variables in an attempt to ameliorate the attentional difficulties currently experienced in school by many hyperactive children. Also, while the present study provides some evidence that methylphenidate has a beneficial effect on the performance of certain relatively simple tasks over a short period of time, we need to know whether this beneficial effect also applies to more complex behaviours over longer periods of time.

SUMMARY

The maintenance of attention to an experimenter-paced task requiring the detection of significant stimuli was impaired in hyperactive children. When compared with a matched normal control group, the hyperactive children detected fewer of the significant stimuli and made more incorrect responses to non-significant stimuli. The presence or absence of an auditory distractor had no influence on the performance of either group of children. Those hyperactive children treated with methylphenidate (ritalin) showed a significant improvement in all aspects of their performance when compared to a control group of hyperactive children given a placebo.

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CRITICAL NOTICE

Carmichael's Manual of Child Psychology. Edited by P. H. Mussen. 3rd Edn. Wiley, New York, 1970, Vol. 1, pp. xix + 1519, Vol. 2, pp. x + 872.

What is the present state of child psychology? There is no better way of surveying the field than to peruse the latest edition of Carmichael's *Manual*, the stated purpose of which is to present a comprehensive and accurate picture of the current state of knowledge in the psychology of human development. To cover the whole field of child psychology in one publication is indeed an ambitious undertaking—one which could be undertaken with comparative ease in 1954, when the last edition was published, but which is now a tremendous challenge to ingenuity in selection, compression, and arrangement.

Inevitably, the first impression one obtains when comparing this edition with its predecessor refers to quantitative things: two volumes instead of one, 2400 pages instead of 1300, 29 chapters instead of 19, 37 contributors as opposed to 22. One's sympathies are already with the editor of the next edition! To bring out the present work must have involved a Herculean effort expended over several years. No doubt this explains the marks of hasty production characterizing, in particular, the second volume: the numerous typographical errors, the slipshod and unsatisfactorily arranged author index, the incomplete list of contributors, the substitution of one page (587) from the first volume. These matters will, one trusts, be put right by the publishers in subsequent reprintings. They represent the usual petty complaints of the book reviewer and, however justified, are of less interest than the overall picture which such a wide-ranging review affords. So, where stands child psychology?

At the cost of considerable over-simplification, it may be concluded that developmentalists are at present struggling with three kinds of problems, concerned respectively with methodological, theoretical, and content issues. Let us examine these in turn.

The methodological issue is raised most clearly in the Manual by Feshbach. At the end of his chapter on Aggression, after a long, careful, and very complete review of the many studies which in recent years have examined this topic under laboratory conditions, Feshbach reaches the conclusion that the most obvious and most important *hiatus* in this area refers to the absence of descriptive, normative data bearing on the development of aggression. Moreover, on the antecedent side of the developmental sequence, our knowledge of the stimuli that elicit aggressive behaviour at different ages is surprisingly limited: the best source of information on this aspect remains Goodenough's study published over 40 years ago. Thus the great bulk of experimental studies of aggression which now exists is founded on a misconception, namely, that we know the nature and manifestation of the basic phenomenon and that we are sufficiently acquainted with the developmental patterning of aggressive behaviour and of its antecedents to enable us to manipulate its expression under controlled conditions. This is not the case: we lack the required descriptive base.

The same conclusion could have been reached at the end of many of the chapters here. The issue is a well-known one: whether the investigator should describe or manipulate. In the past two decades the publication policy of most editors of psychological journals (those ultimate standard-setters) has been firmly on the side of the experimenters, with their factorial designs and predetermined response categories. No doubt the influence of ethology will increasingly affect child psychology in this respect and make us undertake an adequate naturalistic description of phenomena before we attempt to manipulate them. But in the period under review even the studies closest to "real life" tended to be laboratory—rather than field—inspired: Project Headstart, for example, constitutes one long series of studies in which groups of culturally deprived children are provided with extra stimulation, without first undertaking a detailed study of the naturalistic environment of such children in order to ascertain just what they are deprived of.

How to combine the virtues of the naturalistic and the experimental approach is a major problem that child psychology must face. Hoffman, in his chapter on moral development, is well aware of this difficulty and contributes a valuable discussion of its implications. Naturalistic research suffers because it lacks the precision and control needed for establishing causal direction and also for making a direct study of the psychological processes involved in socializing the child. But laboratory experiments, when applied to the study of moral behaviour, also have technical limitations to which attention must be given. First, it is impossible to capture the intensity of the parent–child relationship, especially as the child is usually studied in interaction with a strange adult. Second, the moral socialization process is so drastically telescoped in the laboratory that its essential features appear to be lost. Third, the subjects are generally old enough already to possess the moral standards under study, so that it becomes impossible to investigate the acquisition process itself. And fourth, experimental treatments are often more salient than control treatments, making theoretical interpretations of the findings questionable. To suggest that both approaches have a contribution to make and that both should be used is easy enough, but their precise interweaving remains a problem for the research worker. In the period preceding the second edition, descriptive studies were employed in order to yield normative data, but in the last 15 years the focus has switched instead to the search for processes. The pendulum may now be swinging back again to descriptive studies—motivated partly by the suspicion that we have been concentrating too much on artificially isolated phenomena and that greater care must be taken to take cognizance of the total context, and partly by the realization that behaviour models imported from the study of other species cannot take the place of a thorough acquaintance with the human child. In this respect it is encouraging to find that even in an area as traditionally tough-minded as the study of learning (reviewed here by Stevenson) investigators are becoming less influenced by the laboratory performance of rats and dogs and more by the behaviour of children in real life situations—hence the considerable attention recently to such topics as social reinforcement and the role of language in learning.

The second general issue concerns the theoretical framework within which child psychologists prefer to work. Four such frameworks are mentioned in the Manual: psychoanalysis, Werner's organismic theory, learning theory, and Piagetian theory (a chapter is also devoted to ethology, but its author, E. H. Hess, rightly talks of it more in terms of a particular approach to the study of behaviour than as a unitary set of theoretical viewpoints). The chapter on psychoanalysis could not be completed in time for inclusion in this edition, but one wonders whether this is of any great consequence. Its influence is largely historical; it has been assimilated well but is currently stimulating few developmental investigations directly based upon its postulates. It is surprising, however, to find a chapter devoted to Werner's theory. Though Werner devoted himself wholeheartedly to the study of development, his influence, like his writing, was limited and confined to rather specific areas, and as a result the total amount of research inspired by him is comparatively small. He is unlikely to appear in subsequent editions of the *Manual*.

The remaining two theories, however, namely Piagetian and S–R theory, remain powerful influences on the nature and direction of research. The differences between them, in terms of concepts, techniques, and even the phenomena under investigation, are great, yet it is fascinating to observe the various signs of rapprochement that appear repeatedly in these pages. Piaget, in his chapter on "Piaget's theory", seems rather more aware of the work of others than he showed himself to be some decades ago, but the accommodation has been largely on the side of the S–R theorists. This becomes very clear in Sheldon White's chapter on the learning theory tradition, in which he acknowledges the extent to which this tradition has been affected recently by the cognitive–developmental point of view, as illustrated by the increasing use of such function words as "concrete operations", "mediation", and "analysis-by-synthesis", and by the need to postulate central representational elements in the explanation of such a learning phenomenon as imitation. Kagan and Kogan, in their discussion of "Individuality and Cognitive Performance", probably go furthest among the American authors in stressing the anti-behavioural trend: cognitive processes (they suggest) may eventually be recognized as the structures currently missing in psychological theories—analogous to the cell in biology or the molecule and atom in chemistry. Thus psychology must be as much concerned with cognitive processes as with behaviour, for it is a sign of maturity in a science that it ceases to be preoccupied with public phenomena and turns its attention to the more covert hypothetical processes that must form the bases of its theories.

However vague such a formulation may be, it reflects the quite extraordinarily powerful influence of the Piagetian approach which emerges in practically every chapter. The chapter on learning in children is one of the very few that makes no reference at all to Piaget, but perhaps one should regard it as a major concession that even here it is concluded that the studies reviewed "do not suggest the total malleability of children"! Some authors attempt to reconcile the two major theories: Hoffman, for example, suggests that each may be useful in relation to different aspects of such a multifaceted phenomenon as moral development. Thus learning theory may be best suited to account for the early forerunners of morality, involving specific acts that are rewarded or punished by socializing agents rather than the more general orientations which appear later and which cognitive-developmental theory can handle more easily. Whether any kind of marriage between the theories is feasible, however must be doubted; the unproductive attempt in the 1940's to mate psychoanalysis and learning theory should serve as a warning. What does become apparent is the extent to which child psychology has broken out of its rigid, S–R dominated shell and is now actively concerned with below-the-skin events—however conceptualized.

The third issue concerns content—what are the topics to which child psychology can most profitably address itself at the present time? The current emphasis on cognition as opposed to affective-motivational processes is well known; it is reflected in the fact that only one chapter (that on aggression) in the present edition can be clearly assigned to the latter category. Are we dominated once again by the vision of man as an essentially rational being? Are we reacting against Freudian influences? Or are we simply carried away by the availability of techniques? Techniques certainly do dictate the direction of research—one need only look at the chapter on infancy contributed by Kessen, Haith, and Salapatek to appreciate how influential (to take just one example) Fantz's visual preference technique has been in stimulating research and generating new problems. As a result our knowledge of infant perception is now far greater than, say, of infant anger—yet who dares to say that one is more important than the other? But a social science is not entirely free to develop its own subject matter and increasingly just now the outside community is exerting pressures for child psychologists to become aware of socially-generated problem areas. Hence the research on creativity (ably reviewed here by Wallach), hence also the concern about the effects of cultural deprivation (discussed by R. D. Hess in his chapter on Social Class and Ethnic Influences on Socialization). Perhaps these topics are not really new: creativity, as Wallach points out, has had its forerunners in giftedness, insight, intuition and other currently less respectable terms. But the change is not merely a verbal one; it lies also in the urgency with which society is requesting the child psychologist to devote himself to socially relevant areas. In the past the teaching profession has been our biggest potential customer, and its demands are described accurately here by Roher in a chapter on "Cognitive Development and Education". But society's ills are not merely of a cognitive nature—will the next edition, one wonders, have a chapter entitled "The Growth of Altruism"?

To write an exciting review is indeed a difficult task, for by definition it is concerned with old material and does not present new findings. Yet a review can be creative and constructive: it can discern trends not previously apparent, it can point to directions in which we appear to be heading, and new conceptual schemes may even emerge from such an integrative effort. Nearly all the authors of these reviews address themselves to the problem of further research required, though their efforts result mostly in a list of minor holes to be plugged rather than in any major theoretical restructuring. This is hardly surprising; one cannot expect more in a book such as this. So the intriguing question remains—What will the next edition of this valuable *Manual* look like?

H. R. Schaffer

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BOOK REVIEWS

Annual Progress in Child Psychiatry and Child Development—1970. Edited by STELLA CHESS and ALEXANDER THOMAS. Brunner/Mazel, New York, 1971, pp. 585. $15.00.

THIS IS the third of an annual series of collections of outstanding papers in the field which continues to improve in excellence year by year and promises to become a standard work of reference.

The aim is not to be comprehensive in covering all published work but sets a standard by which the remainder may be judged. As in previous years a pattern is followed in which some 37 papers published during 1969 in English language journals are reproduced in their entirety. They are grouped together in almost exactly equal numbers under the two main headings and further subdivided into 11 sections each covering an area in which particular advance or interest had been focussed during the year. There are, however, few papers from this country, which perhaps reflects both the paucity of research in this field here as well as the transatlantic origins of the book.

This deficiency is particularly marked in the section on child development where the major preoccupations are with the effects of early environmental stimulation and deprivation. The carefully controlled study by Rheingold on the effect of increased stimulation in maintaining positive behaviour in 10-month-old infants starts the book in good style, though there is a neglect of discussion of the possible causes in variations in baseline behaviour.

Shaffer and Parry's study of the development of discriminative responses in infants and the expectancy model proposed by Lewis provide additional clues to the development of early mother-and-infant interaction, while the value of the isolated case study of pathological development is illustrated by the finding of Rappaport that an infant with congenital sensory neuropathy, although delayed in motor development, was able with intact special sensation to maintain normal social and emotional relationships.

The section on infancy studies concludes with an examination by Kagan in which the interesting finding of a sexual dimorphism in infant vocalization is carefully discussed in the light of other possible variables. The tentative conclusion that differences in maternal practices towards sons and daughters may be more important than biological sex differences tends, however, to neglect the possible interaction between the two in shaping this behaviour.

In considering cognition and language development the papers are carefully chosen to emphasize the importance of considering development in relation to educational practice, and a masterly discussion by Lennenberg of the biological basis for language development provides sobering reflection for those who seek to modify language. His personal finding of the ineffectiveness of conventional speech training in retarded children, while probably correct, does however still require carefully controlled evaluation of newer techniques before it can be said to be proven.

The remainder of the section on child development is devoted to the effect of social factors in which an optimistic note is struck by the emphasis on the possible beneficial effects of industrialization in under-developed countries and the benefits of good group care with explicit aims with older children in developed countries, while the effects of malnutrition as a major cause of impaired development in both situations serves to emphasize the point at which most urgent attention is required.

Once again major emphasis is given to the subject of racism, which fortunately does not require from us such a soul-searching of the statistics to calm the almost hysterial controversies which have arisen over this subject in the United States.

In the six sections covering the field of child psychiatry most space is given to the topics of childhood psychosis and the provision of psychiatric services which together account for more than half the papers. However, as in last year's edition, this part of the book opens with a flourish with a broad overview of child psychiatry by Eisenberg covering on this occasion the important changes which have taken place over the past 25 years. This period, which commenced with the description by Kanner of the syndrome of early infantile autism, is covered in a masterly review which follows through the awakening interest in the epidemiological methods and the scientific study of the biosocial and psychosocial factors affecting child development.

The erudite and tongue-in-cheek review of the problems facing the diagnostician presented by Kanner in the first Kenneth Cameron Lecture leads easily into the paper of the triaxial classification of mental disorders in childhood; the first steps by an international study group set up by W.H.O. to devise a generally acceptable international classification which promises to aid communication between child psychiatrists and facilitate research in this field.

This goes some way to meeting the problems posed by Kanner in flexibly meeting the need for clearer-cut diagnostic categories while catering for peculiarities posed by the individual child.

Mental retardation is represented by only two papers which, while covering important topics, tend to be more diffuse and less critical. The attempt to classify emotional disorders concludes perhaps inadvisedly on the basis of the evidence offered that these disturbances differ qualitatively from those in children of normal intelligence and, while admittedly based on a large sample, it is not clear how epidemiologically representative this is. Similarly in the study of parental expectations towards their retarded children there is little indication whether the changes following counselling have any relation to future family adaption and the value of such an approach as opposed to more practical help and advice may well be questioned.

The two follow-up studies of psychotic children by Bender and Rutter reach broadly similar conclusions, particularly in so far as the poorer prognosis of those who are more retarded intellectually is concerned; although the latter study with its more precise methodology focussing on the psychological test results of the authors sample will be more useful to the clinician in identifying factors predictive for outcome. The special abilities of psychotic children are considered both in this article and in the more anecdotal and theoretical account by Cain in which the particular difficulties of integrating experience and comprehension are cloaked in an attempt to arrive at rather too broad a dynamic formulation of the problem.

Churchill's programme of behaviour modification with psychotic children opens up further possibilities for treatment and it will be of interest to see a controlled study of this technique. While Schopler's study of thought disorder in mothers of psychotic children identifies this as a secondary effect in a careful and well-designed study providing an instance of how research in child psychiatry may have implications for adult psychiatry.

A similarly sophisticated study by Anthony of children of psychotic parents identifies some of the factors acting in this family situation as well as their implications for treatment and separation, while the clinical section ends with valuable studies of suicidal behaviour and the highly specialized management of psychiatric disorders in severely burned children and those with cardiac pacemakers. The latter group make a surprisingly good adjustment to their handicap, while the former patients require special skills which must be subtly extended to meet the need of those involved with the child in his painful and handicapping situation.

New methods of organization in the provision of services are considered in three articles and, while these are thought-provoking, one is inevitably led to the conclusion that the pattern of services will to a large extent be determined by the situation in which the child presents and that perhaps a small number of highly skilled and experienced professionals can achieve more economically than a more prolonged and elaborate programme by a comprehensive team.

Once again this volume reaches a very high standard, the papers being grouped perhaps in a more logical sequence than in previous years with a greater concentration on a small number of topics which makes it not only more readable but of greater value to both clinician and research workers.

The reduced price and change in format will add to the attractions of the volume.

JOHN CORBETT

Behaviour Studies in Psychiatry. Edited by S. J. Hutt and Corinne Hutt. Pergamon, Oxford, 1970, pp. ix + 223. £2.50.

This book is based on the proceedings of a symposium held in Oxford in 1968. The main theme is the use of direct observation as a method of studying various kinds of human behaviour in natural settings. Two papers discuss ethological methods and ideas; the rest are accounts of observational research, most of them being studies of autistic children. The three papers not looking at autism include Esser's work on interaction patterns in a psychiatric ward, Coss on eye spot patterns and gaze behaviour, and Grant's work on non-verbal behaviour in interviews. The six papers on autism cover operant modification of approach behaviour, gaze aversion, behavioural regularities, stereotypies, and effects of sensory isolation.

There is much of interest in these brief research reports, although there is some inevitable unevenness in quality as one moves from author to author.

Chance's paper discussing structure in behaviour is thought-provoking and sounds some worthwhile cautions about the use of ethological techniques in the study of human behaviour. However, the Hutt's initial paper with its enthusiasm for teaching us all how to be zoologists is irritating and not without naïveté in places. The use of direct observation in psychiatry may well be profitable and long overdue. However, the technique is not the exclusive contribution of the ethologists, to be presented to our heathenish eyes as if it had been acquired by holy covenant, on a scientific mountain top, amidst a fiery cloud of methodological virtue. Those psychologists who have used these methods for 40 years are likely to resent the editors' prim comments about the putative reliance of psychologists and psychiatrists upon rating scales. Why it should be scientifically better to couple fine measurement of some micromolecular behaviour with teleological conjecture about its functional and evolutionary significance is not made clear.

The research described in the book should be of interest to all concerned with the use of controlled naturalistic observation in psychiatry.

Lawrence Bartak

A Neuropsychiatric Study in Childhood. Clinic in Developmental Medicine Nos. 35/36. Michael Rutter, Philip Graham and William Yule. Heinemann, Philadelphia, 1970, pp. vi + 272. £3.75.

This book sets out to try to answer a number of questions: Is the rate of psychiatric disorder increased in children with organic brain dysfunction? If so, is this due to the presence of physical handicap, or to a disorder of the brain? Is there a specific type of psychiatric disorder associated with organic brain dysfunction? And when psychiatric abnormalities do occur, what may be the causes for this? The answer to the last question may be determined by differences in the child, in the environment, and in the extent and site of the brain disorder and the age at which it occurs.

Anyone working among handicapped children knows the desperate need for facts and figures to try to answer such questions and as a basis for planning future services to meet these needs. This book starts with details of the neurological examination used, and then examines its reliability. This emphasizes the limitations of the standard neurological examination when assessing handicapped children, and the need to use techniques appropriate to the child's age and development.

The section on the epidemiology of neurological handicaps shows some interesting findings. The incidence of cerebral palsy was 2·9 per 1000. This figure, which is higher than in other surveys, may indicate the more efficient screening methods. It does not suggest a decline in the rate of cerebral palsy. The feeling that people with physical handicaps should be less, rather than more, liable to emotional disorders should be dispelled for ever by the figure of 58·3 per cent for the prevalence of psychiatric disorders among children with lesions above the brain stem, associated with fits; and there are many other interesting findings presented by this study.

The presence of a chronic physical handicap is not a crucial factor. It is the dysfunction of the brain which is related to the high rate of psychiatric disorders. There are few features of behaviour, emotions or relationships characteristic of organic brain damage. However, it may well be that certain conditions, such as infantile psychosis and the hyperkinetic syndrome, are often linked to brain damage. Many variables are associated with psychiatric disorders among these handicapped children so that, although lesions of the brain play an important part in aetiology, it rarely seems to be an exclusive one. It is not surprising that 75 per cent of those with retarded language had psychiatric disorders, as language is used to such an extent in making sense of the environment and in impulse control. This is supported by low intelligence and reading retardation being the two variables most strongly associated with such disturbances. Broken homes and emotional disturbances in the mother are other factors, and these must surely be considered in any plans for the future care of these children. It shows that in an effort to keep them within the community too great a burden must not be placed on the family.

There can be no doubt that a study of this kind raises more questions than it answers, but therein lies its fascination, and there is no doubt that it will be of interest to all those trying to premote the welfare of handicapped children. Its findings will undoubtedly be quoted for some years to come.

NEIL GORDON

J. Child Psychol. Psychiat., Vol. 12, 1971, pp. 149 to 152. Pergamon Press. Printed in Great Britain.

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emotional sensitivity, intelligence,
orphanage children

HEYNE, WILLIAM M. and JAHODA, GUSTAV (1970) Emotional sensitivity and intelligence children from orphanages and normal homes. *J. Child Psychol. Psychiat.* **12**, 77–90.

mmary—Eighty orphanage children, 6–10 yr old, were matched with children in ormal homes and tested for recognition of emotion in speech. Recognition scores were gher for (a) negative than positive emotions, (b) female than male voices, and (c) ucated and uneducated speech, though these effects interacted with age. Orphanage ildren showed no consistent differences from their controls apart from an inferiority recognition of emotion in male voices. Recognition scores correlated with both verbal d non-verbal ability and correlations decreased with age. It is concluded that the velopment of emotional sensitivity is related more to general perceptual and intellecal factors than to specific experience with emotions.

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research, reading retardation,
two critical problems

PPLEBEE, ARTHUR N. (1971) Research in reading retardation: Two critical problems. *Child Psychol. Psychiat.* **12**, 91–113.

mmary—This paper presents a review of research in reading retardation, conlering primarily American investigations. It concentrates upon a few methodological d conceptual problems common to most past work rather than upon specific studies specific results. Various definitions of the disorder are discussed, and their confusion practice is seen to have led to an unjustified assumption of homogeneity in the samples idied. Possible models of the disorder are reviewed, and evidence presented which ggests the usual models are inadequate. The paper concludes with a brief introduction the statistical problems which the new models raise.

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autonomic responses, male adolescents, refractory
behaviour

DAVIES, JOHN G. V. and MALIPHANT, RODNEY (1971) Autonomic responses of male adolescents exhibiting refractory behaviour in schools. *J. Child Psychol. Psychiat.* **12**, 115–127.

Summary—Adolescent boys, judged by the majority of their teachers as refractory, were found to have significantly lower base heart-rates than their matched controls. Two supplementary experiments, using a simple reaction-time design but with the subjects experiencing different degrees of threat or stress, supported this general finding. Autonomic reactivity, as measured by changes in heart-rate, was less for refractory subjects than their controls under both conditions. Possible implications of these findings for the treatment of children were briefly considered.

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attention, hyperactive children,
methylphenidate (ritalin)

SYKES, DONALD H., DOUGLAS, VIRGINIA I., WEISS, GABRIELLE and MINDE, KLAUS K. (1971) Attention in hyperactive children and the effect of methylphenidate (ritalin). *J. Child Psychol. Psychiat.* **12**, 129–139.

Summary—The maintenance of attention to an experimenter-paced task requiring the detection of significant stimuli was impaired in hyperactive children. When compared with a matched normal control group, the hyperactive children detected fewer of the significant stimuli and made more incorrect responses to non-significant stimuli. The presence or absence of an auditory distractor had no influence on the performance of either group of children. Those hyperactive children treated with methylphenidate (ritalin) showed a significant improvement in all aspects of their performance when compared to a control group of hyperactive children given a placebo.

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The British Journal of Medical Psychology

Volume 44, Part 2, June 1971

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HEINZ H. WOLFF The therapeutic and developmental functions of psychotherapy
LOUIS A. GOTTSCHALK Some psychoanalytic research into the communication of meaning through language: the quality and magnitude of psychological states
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J. Child Psychol. Psychiat., Vol. 12, 1971, pp. 153 to 155. Pergamon Press. Printed in Great Britain.

DONALD WINNICOTT

AN APPRECIATION

DONALD WINNICOTT, paediatrician and psycho-analyst, died in February of this year at the age of 75. This appreciation of his work is written from the point of view of a social worker and a social work educator. That itself is significant. For Winnicott influenced many outside his own disciplines, not least, of course, the "ordinary devoted mother" to whom the radio talks in the 1940's were addressed. For those of us who knew him, it is hard to separate Winnicott the man from Winnicott the author. That may sound an unnecessary exercise, for are not the books the man? However, it does have a particular relevance in his case. Winnicott taught generations of social work students at the London School of Economics. His marriage to Clare—herself a leading figure in social work, especially in the field of child care—brought him in touch with many more social workers. Clare and Donald actually *enjoyed* conferences and parties and many who might not have read his work met him in these situations or heard him speak. Thus his direct personal impact on us was considerable and the nature of that impact is of importance in considering his writing. He was a man of great charm and humour but this is not really the point. He had that rare gift of concentration upon the person of the moment, so that in the crowded room at a party, or in answer to a questioner in the audience, one felt his undivided attention in an attempt to understand the communication, whether light-hearted or serious. This gave one the sense that in the deepest kind of way this man knew what he was talking—and writing—about. To those of us who knew him, therefore, there was—let us be frank—a predisposition to read his work with sympathy and an absolute certainty that, however difficult it may have been at times to follow, it was always worth doing so. Because we knew that he tried to understand people freshly. This, of course, is one of his outstanding contributions to paediatrics. The depth and detail of his child observation, perfected at Paddington Green Children's Hospital and brilliantly illustrated in his last published posthumous work,* has, to my mind, the elements of genius in that the familiar is observed as if for the first time. And, true to his calling as a psycho-analyst, these observations include an appreciation of the interaction between himself and the other, of his response to them as well as theirs to him. In a sense, therefore, observation is too detached a word. For in all his contacts, Winnicott sought a meeting and his theoretical formulations arose from a profound use of subjective experience. There may be those who are critical of such an approach. Winnicott was, and remained to the end, a clinician, deeply concerned with the integrity of evidence but convinced that for him "the avenue to truth" was through this scrutiny of personal and professional interaction. I believe we need this urgently as a complement to the rigours of conventional scientific investigation, whose measuring tools in the behavioural sciences are, as yet, so crude.

**Playing and Reality*, Tavistock Publications (1971); See in particular "Edmund and Diana", Chap. 3, pp. 41 ff.

I referred to the difficulty in reading Winnicott's works. This is not the whole story. Certainly, one gets the impression that the writing was a struggle and, at times, it is a struggle for the reader, too, for his style is highly idiosyncratic. Unlike so many, he was incapable of skimming like a water-beetle over the surfaces of ideas. However, all his writing is illuminated with moments of absolute simplicity, when the effort to comprehend results in a sudden clarification. Sometimes, the processes by which this is reached are not fully spelled out and the reader has to make an imaginative leap with the author. But, unlike some popular psychology, his simplicities are not over-simplifications. They speak truth to the mind and to the feelings and are grounded in important hypotheses born of patient clinical observation.

Winnicott owed much to Melanie Klein, upon whose theory he constantly drew, though he was independent and original in his own formulations and without the doctrinal dogmatism which characterized some of her followers. Indeed, he never identified himself with the schools and factions within the psycho-analytic movement. This flexibility in theory and in practice is, I believe, one reason for his appeal to social workers. He was interested in developing a variety of styles of interventions of which the conventional psycho-analytic procedures were only one. Thus in *Playing and Reality* he refers to work with a patient in which the sessions were of two or three hours' duration and there were refreshments—"a gas ring, coffee, tea and certain kind of biscuit are reliably available."† (I am sure he would have been the first to say that his need for coffee was as great as the patients'.)

Linked to this flexibility was his concern with economy of effort in intervention. His wife has told me that he often used to say: "What is the *least* that I can do?" His papers are full of examples of occasional consultations and of attempts to support and mobilize those who cared for his patients. For social workers, psycho-analytic theory has been of great use in the understanding of behaviour. But the attempt to model, *albeit* in watered-down form, social work upon psycho-analytic practice led social work badly astray, especially in the United States of America. Winnicott's characteristic personal style, linked to a real knowledge through his wife of what social workers in statutory settings actually have to do, enabled him to reassure those in the field in a deep kind of way of the value of limited intervention.

The partnership of Donald and Clare Winnicott has had a far-reaching effect on the development of British social work. In 1947, when the first training for Child Care officers was set up at the London School of Economics, Clare was in charge. It was a time, following the Curtis Committee, of great concern about the emotional impoverishment of the deprived child. I would guess that, when the professional history of that period comes to be written, the influence of Bowlby and the Winnicotts in shaping the development of the child care service will stand out. Bowlby's impact is well known. Donald Winnicott's is perhaps more elusive but no less important. For more than 40 years, he studied, and wrote about, the interaction between ordinary and disturbed parents and their ordinary and disturbed children, especially about the earliest experience of mothers and their babies. He went to the roots of this experience, a man outside it in touch with his own maternal feelings. Always he conveyed understanding and compassion for parents as well as for children and was never narrowly identified with his patient; there could hardly have been a better model for the social worker in child care work. From his fascination with the early years, he went on to consider not only adult and adolescent behaviour but wider cultural phenomena. Whatever dispute there may be on points of detail, whatever new ingredients (as for example sociology) are now a part of the education of social workers, social work needed—and still needs—the frame of reference which Winnicott offered for the understanding of people in distress. In an era when the behavioural sciences advance so rapidly, we need a Winnicott to remind us that in the pursuit of all knowledge intuitions play an important part, and that, for intellectual advance in this field, the complexity of emotional life must be acknowledged, not by-passed. Social workers see and must grapple with such complexities in practice. A colleague once said to me: "We are brokers in lesser evils." As social workers, therefore, we also need a Winnicott to relieve intolerable omnipotence. His mothers had only to be "good enough", not perfect. So do the social workers.

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†*Ibid.*, Chap. 4, pp. 56 ff.

Donald Winnicott died soon after correcting the proofs of *Playing and Reality*. It is indeed vintage Winnicott. In it, there is a child's fascination with play; the curiosity and excitement of a young man; the confidence of mature middle years. I am not sure if there is an old man there, unless it is in the acceptance of limits. Certainly, there is no sense of disengagement from life. The last paragraph of the last paper gives some indication of those qualities for which we as social workers will value him.

> "In brief, it is exciting that adolescence has become vocal and active, but the adolescent striving that makes itself felt over the whole world today needs to be met, needs to be given reality by an act of confrontation. Confrontation must be personal. Adults are needed if adolescents are to have life and liveliness. Confrontation belongs to containment that is non-retaliatory, without vindictiveness, but having its own strength. It is salutary to remember that the present student unrest and its manifest expression may be in part a product of the attitude we are proud to have attained towards baby care, and child care. Let the young alter society and teach grown-ups how to see the world afresh; but, where there is the challenge of the growing boy or girl, there let an adult meet the challenge. And it will not necessarily be nice.
>
> In the unconscious fantasy these are matters of life and death."*

OLIVE STEVENSON

***Ibid.*, Chap. 11, p. 150.

J. Child Psychol. Psychiat., Vol. 12, 1971, pp. 157 to 172. Pergamon Press. Printed in Great Britain.

EFFECTS OF BRIEF SEPARATIONS FROM MOTHERS DURING INFANCY ON BEHAVIOUR OF RHESUS MONKEYS 6–24 MONTHS LATER

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INTRODUCTION

WHEN THE mothers of rhesus monkey infants who were 20–32 weeks old were removed for 6 days, the infants showed behavioural changes which included increased calling when the mother was first removed, and then decreased locomotor activity and other changes which could be loosely described as "depression". After the mother was returned, many of the infants were at first intensely clinging. However, after a period of mutual readjustment, the mother–infant relationship usually became near-normal within a month or so, though in some cases the effects on their interaction were still apparent at the end of that period (Spencer-Booth and Hinde, in press). Comparable data have been obtained for rhesus by Seay and Harlow (1965) and for other macaques by Kaufman and Rosenblum (1969). In this paper we are concerned with the longer-term effects of the separation experience: mother–infant interaction over the ensuing months, and the behaviour of the infants in certain tests at 12, 18 and 30 months of age, are compared with those of control infants which had had no separation experience.

MATERIAL

Each infant was brought up with its mother in one of six small social groups (1 adult male, 2–4 females and their young). Each social group occupied an outside run communicating with an inside room (see Fig. 1 in Hinde and Rowell, 1962). The infants fell into 3 treatment groups:

(i) *Controls.* These lived continuously in their respective social groups ($N = 8$, but no data are available for some animals for some tests or watches).

(ii) *Single separation (SS) infants.* These infants had had their mother removed from the group for 6 days when they were 30–32 weeks old ($N = 5$; some animals not available for some tests or watches).

(iii) *Twice separated (TS) infants.* (*a*) Infants which had had their mother removed from the group when they were 21 weeks of age, and again when they were 30 weeks old ($N = 4$; some animals not available for some tests or watches). (*b*) Infants which had had their mother removed from the group when they were 25–26 weeks old, and again when they were 30 weeks old ($N = 4$; some animals not available for

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some tests or watches).

For present purposes these infants (*a*) and (*b*) are considered together. In addition, for some comparisons with the controls data from SS and TS infants were pooled ("separates").

METHODS

The data presented here come from three main sources.

1. *Test data*

Previous work indicated the feasibility of assessing behavioural characteristics of individuals from their responses to standard situations, especially mildly disturbing or frustrating ones (Spencer-Booth and Hinde, 1969). That paper included data on the control infants and 4 of the once-separated infants described here. The tests given at 12, 18 and 30 months have now been administered to an additional once-separated infant and to the twice-separated infants.

Some tests given at 12 and 30 months and all those at 18 months were carried out in the home run. At least 7 days before the start of the 12-month tests a "filter cage" (236 × 122 × 122 cm) was connected at ground level to the outside of the run in which the group lived. It was connected to the run by a hole large enough to admit the infant but too small for adults, and the infant had free access to it. After the 12-month tests in the home runs, when the infant was 51–56 weeks old, infant and mother were brought to indoor laboratory cages: these were 100 × 107 × 122 cm high, communicating with another cage of similar size (the "filter cage") by another "baby filter". The infants were watched and tested in this situation over 9 days (Days 0–8).

After the 30-month tests in the home run, when the infant was 130–149 weeks, it was taken by itself to one of the indoor laboratory cages. The cage was screened from adjoining cages by sheet metal and from most of the room by hardboard screens, extending forward into the room from the sides of the cage. The animals were watched and tested for 16 days (Days 0–15).

The tests are described only briefly here: fuller details are given in the earlier paper. The order of tests was standardized for all animals, and all animals were thoroughly familiar with the experimenters.

Some of the tests involved repeated trials. Since previous work showed rank orders on successive trials to be correlated (Spencer-Booth and Hinde, 1969), we compared the sums of the ranks on all trials with Mann-Whitney *U* tests, 2-tailed. This procedure gives equal weight to each trial. To give an indication of the actual performance, the tables include also the median of the sums of the actual scores on all trials (except in the case of median visit lengths where the overall median is given). Low ranks were given to low latencies, high time in, etc.—in other words, to "good" performances in the tests.

2. *Routine watches on mother–infant interaction*

Each mother–infant pair was watched for a total of 6 hr in particular weeks according to age, as described by Hinde and Spencer-Booth (1967). The routine watch data discussed here are those obtained in the home run immediately before the 12 and 30-month tests, and in watches in the indoor cages at 12 months.

The measures used here are as follows:

(i) *Total time off*. The number of half-min in which the infant was recorded off its mother, as a percentage of the number for which it was watched.

(ii) *On and off*. The number of half-min in which the infant was recorded both on and off its mother, as a percentage of the number it was recorded off her.

(iii) *Frequency of rejections* (R). The number of occasions on which the infant attempted to gain the nipple and was rejected by its mother, as a percentage of the number of half-min watched.

(iv) *Relative frequency of rejections:* $R/(A + M + R)$. The ratio of the number of occasions on which the infant was rejected by its mother to the sum of the number of occasions on which it was accepted by her (A), picked up on her initiative (M) and rejected by her (R).

(v) *More than* 60 *cm* ($>$ 60 *cm and more than* 60 *cm only*). The number of half-min which the infant was recorded more than 60 cm from its mother, and the number it spent wholly more than 60 cm from her, in each case as a percentage of the number it was off her at all.

(vi) *Infant's initiative in maintaining proximity* ($\%Ap.-\%L$). This is a measure of the infant's role in maintaining proximity to its mother while it is off her (Hinde and Atkinson, 1970). It is indicated by the difference between the percentage of occasions on which the distance between mother and infant decreased from more than 60 cm to less than 60 cm due to movement by the infant, and the percentage of occasions on which it increased from less than 60 cm to more than 60 cm similarly.

3. *Activity watches*

To assess the activity of the infants in their home runs, the run was considered to be divided into 16 boxes formed by 8 rectangles in the horizontal plane and upper and lower components in the vertical. The number of boxes entered in each half-min, and the activities performed there, were recorded on check sheets (see Spencer-Booth and Hinde, 1969). The measures taken were expressed in terms of the mean number of boxes entered per half-min, or the number of half-min during which the infant was engaged in each type of activity as a percentage of the number it was off its mother and all other animals.

For watches in the laboratory cages at 30 months, the cage was considered to be divided into 8 boxes formed by 4 rectangles in the horizontal plane and upper and lower components in the vertical. The number of boxes used here was smaller than in the outside pens because of the much smaller size of the cages.

(i) *Overall activity*. The mean number of boxes entered per half-min.

(ii) *Activity when active* $> 5/ > 1\%$. To assess how active the animal was during its bouts of locomotor activity, we expressed the number of the half-min in which it entered $>$ 5 boxes as a percentage of the number in which it entered $>$ 1 box. The lower the percentage the lower the activity when active.

(iii) *Sitting* ($\%S$). The percentage of half-min in which the infant was recorded as just sitting and not engaged in any obvious activities.

(iv) *Eating* ($\%E$). The percentage of half-min in which the infant was recorded as eating, either from the supply or its pouches.

(v) *Manipulative play* ($\%SF$). The percentage of half-min in which the infant was recorded as fiddling with objects such as pieces of chain or wire.

(vi) *Social play.* (a) *Rough and tumble* ($\%R$ & T). The percentage of half-min in which the infant initiated contact play with another animal, or responded thus to play initiated by another animal. (b) *Approach/withdrawal* ($\%A/W$). The percentage of half-min in which the infant initiated non-contact play with another animal, or responded thus to play initiated by another animal.

(vii) *Following mother* ($\%F$). The percentage of half-min in which the infant was recorded as following at its mother's heels as she moved around the pen.

RESULTS

12-*Month mother–infant interaction*

In home runs. The data from the routine watches on each mother–infant pair in their home runs when the infant was 52 weeks (or the last watch before the infant reached this age) were compared between 8 control, 5 SS and 8 TS infants (Table 1).

TABLE 1. ROUTINE WATCH DATA AT 12 MONTHS. MEDIAN VALUES AND P VALUES BASED ON MANN-WHITNEY U TEST, 2-TAILED

Watch	Measure	Controls ($N = 8$)	SS ($N = 5$)	TS ($N = 8$)
Home run	Time off	72	73	72
	$R/(A + M + R)\%$	63	14	58
	> 60 cm only	63	56	46
			$p = 0·002$	
	%Ap.–%L	5	9	14
Indoor cage* Day 1	Time off	38	61	48
	$R/(A + M + R)\%$	4	15	13
	> 60 cm only	10	5	5
	%Ap.–%L	1	6	25
			$p = 0·030$	
	Bout length in filter cage	1·9	1·3	1·5
Indoor cage* Day 5	Time off	69	66	72
	$R/(A + M + R)\%$	18	16	23
	> 60 cm only	15	5	7
	%Ap.–%L	2	5	18
	Bout length in filter cage	2·0	1·5	1·3
			$p = 0·030$	

*For indoor cage tests 6, not 8, controls were available.

For each infant this involved 6 hr collection of data on mother–infant interaction. The time spent at a distance from the mother (> 60 cm only) was significantly less for the TS infants than for the controls. There were no other significant differences.

In the indoor cage on Day 1. On the day after the mother and infant were moved to the indoor cage, they were watched for 4 hr exactly as in the home run, with additional records being made of the infant's entry to the filter cage (Table 1). %Ap.–%L was significantly higher for the TS infants than for the controls. No other measures of mother–infant interaction differed significantly. However, the total amount of activity by the mother as indicated by the sum of her approaches to and departures from the infant (Ap. + L), was significantly higher on Day 1 for both the SS and TS mothers than for the controls ($p = 0.018$ and $= 0.012$ respectively). This was probably because the separated mothers had been kept in an indoor cage during separation and were thus more familiar with it than the mothers of the controls. Ap. + L for infants was also significantly higher for the TS infants than for the controls ($p = 0.042$).

In the indoor cage on Day 5. Watches were done as on Day 1. The only measure for which the groups differed significantly was Bout length in the filter cage, which was shorter for the TS infants than for the controls (Table 1).

Summary. There were practically no significant differences in mother–infant interaction at this age, either in the home run or in the indoor cage, although the separated infants tended to stay at a distance from their mothers less and to play a greater role in maintaining proximity (%Ap.–%L higher).

12-*Month tests* (*home runs*)

Four tests were given at 49–53 weeks to 6 controls, 5 once-separated and 8 twice-separated infants (Table 2). The first 3 of these involved the filter cage, and followed each other in immediate succession; this sequence was carried out 3 times, on succeeding days if possible.

The mirror, mirror and grass, and banana tests. These involved placing a mirror in the filter cage for 30 min, placing grass in front of the mirror for a further 15 min, and then replacing mirror and grass with some pieces of banana for 10 min. In each case the latency to enter the filter cage, the total time in and the median visit length were assessed. No significant differences were found between the 3 groups.

Vitamin test. The animals were used to being offered pills by Y.S.–B. At 12 months their behaviour in this situation was recorded 3 times using a 6-point scale of speed of coming to take the pill and willingness to stay near the experimenter while eating it (see Spencer-Booth and Hinde, 1969). The less readily the animal approached the higher the score. The controls came significantly more readily than either the SS or the TS infants.

Summary. With tests involving approaching a strange object or food, there were practically no significant differences between the controls and either of the groups of previously separated infants. However, when the test involved close approach to an observer (Y.S.–B.) the previously separated animals were clearly less ready to approach. This may have been because Y.S.–B. had been involved in catching and removing the mother at the time of the separation.

12-*Month activity watches* (*home runs*)

Data from only 3 control infants, together with 5 SS and 8 TS infants, are available (Table 2).

The separated groups tended to show less overall activity, and to be less active when active, than the controls, but the differences were not significant. Differences in the proportion of time spent sitting were greater and were statistically significant.

TABLE 2. TESTS AND ACTIVITY IN THE HOME RUN AT 12 MONTHS. MEDIAN SCORES FOR THE FIRST FOUR TESTS ARE THE MEDIAN TOTAL SCORE FOR EACH ANIMAL OVER THREE TRIALS EXCEPT MEDIAN VISIT LENGTHS WHICH IS BASED ON OVERALL MEDIANS. FIGURES IN BRACKETS ARE THE MEDIANS OF THE SUMS OF THE RANKS OVER THE THREE TRIALS FOR EACH ANIMAL, ON WHICH p VALUES ARE BASED USING MANN-WHITNEY U TEST, 2-TAILED

Test	Measure	Controls ($N = 3$)	SS ($N = 5$)	TS $N = 8$)
Mirror	Latency (min)	11·5 (35)	4·7 (27)	17·0 (37)
	Total time in (min)	4·5 (31)	7·3 (25)	6·8 (29)
	Median visit length (min)	0·1 (32)	0·1 (34)	0·2 (30)
Mirror and grass	Latency (min)	15 (40)	1·9 (23)	15 (39)
	Total time in (min)	1·6 (42)	11·4 (22)	3·2 (37)
	Median visit length (min)	0·1 (33)	0·2 (27)	0·2 (35)
Banana	Latency (min)	4·2 (33)	0·6 (24)	2·7 (31)
	Total time in (min)	7·9 (26)	11·2 (20)	3·4 (39)
	Median visit length (min)	0·3 (24)	0·4 (26)	0·2 (42)
Vitamin	Rating	6 (12)	15 (34)	8 (48)
		$p = 0{\cdot}004$		
			$p = 0{\cdot}004$	
Activity	No. boxes	3·1	3·2	2·8
	$\frac{>5}{>1}\%$	36	32	25
	% Sitting	2	10	35
			$p = 0{\cdot}012$	
		$p = 0{\cdot}036$		
				$p = 0{\cdot}048$
Type of activity	% Eating	65	75	54
				$p = 0{\cdot}010$
	% $R + T$	6	13	5
	% A/W	8	1	0·5
			$p = 0{\cdot}05$	
	% Manipulative play	5	16	17
		$p = 0{\cdot}032$		
			$p = 0{\cdot}024$	

The SS infants had a higher median for eating than the controls and the TS infants a lower one: the difference between the two separated groups was significant. Similar differences had appeared during the separation period itself.

Approach/withdrawal play was reduced in the separated infants, significantly so in the TS group, but the differences in rough-and-tumble play were variable in direction and not significant. Manipulative play was significantly more frequent in the separated infants than in the controls.

In summary, the previously separated infants tended to be less active, and to show less social and more manipulative play, than the controls.

12-*Month tests* (*indoor cages*)

Data from 6 control, 5 SS and 8 TS infants are available (Table 3).

Mirror and mirror-and-grass tests. These were done on Day 6, the procedure being similar to that in the home runs. There was a general tendency for the previously separated infants to have a higher latency to enter, to pay shorter visits, and to spend less total time in the filter cage than the controls. Most of the significant differences were between the controls and the TS infants, the SS infants generally occupying an intermediate position.

Banana tests. These were given on Day 1 and on Day 6 after the mirror-and-grass test. As in the mirror and mirror-and-grass tests, the previously separated infants tended to have a higher latency to enter, to spend less time in and to pay shorter visits to the filter cage than the controls. The difference was significant between the controls and the TS infants for this last measure.

Vitamin tests. The readiness of the infants to take vitamins from Y.S.–B. (Days 1 and 6) and from a stranger (Day 6) was assessed as in the home run. The differences between the controls and both the SS and TS infants were significant.

Date-out-of-reach. A slab of *ca.* 75 g of compressed stoneless dates was hung outside the filter cage but within the infant's reach on Day 7. On Day 8 a similar slab was hung just beyond the infant's reach and observations made for 30 min. Only one control and the separated infants were tested thus, so the only comparisons possible are between the once- and twice-separated groups. The SS infants showed a shorter latency, and made more attempts, than the TS infants, though the latter difference did not reach significance.

Yellow ball. A yellow plastic ball was placed in the filter cage on Day 6. On a number of measures the SS and TS infants were less ready to enter and stay in the filter cage than the controls, and spent less time in play.

Summary. The previously separated infants approached and interacted with strange objects less readily than did the controls. These differences in behaviour in the strange environment of the indoor cage were much more marked than those found in similar tests in the home run (see above).

18-*Month activity watches* (*home runs*)

Data for 4 controls, 5 SS and 6 TS infants in their home runs are available (Table 4).

TABLE 3. TESTS IN INDOOR CAGE AT 12 MONTHS. MEDIAN SCORES BASED ON THE TOTAL FOR ALL TRIALS OF EACH TEST. FIGURES IN BRACKETS ARE MEDIANS OF SUMS OF RANKS, ON WHICH p VALUES ARE BASED, USING MANN-WHITNEY U TEST, 2-TAILED

Test	Measure	Controls ($N = 6$)	SS ($N = 5$)	TS ($N = 8$)
Mirror Day 6	Latency (min)	0·2	1·3	2·4
			$p = 0{\cdot}042$	
	Total time in (min)	7·9	6·5	6·7
		$p = 0{\cdot}030$		
	Median visit length (min)	0·4	0·3	0·3
			$p = 0{\cdot}03$	
Mirror and grass Day 6	Latency (min)	0·2	0·1	0·4
	Total time in (min)	9·7	8·7	4·2
			$p = 0{\cdot}004$	
	Median visit length (min)	0·8	0·6	0·3
			$p = 0{\cdot}03$	
Banana Days 1 and 6	Latency (min)	1·7 (17)	4·7 (18)	6·2 (27)
	Total time in (min)	6·7 (19)	5·4 (20)	5·5 (25)
	Median visit length (min)	0·9 (17)	0·6 (19)	0·2 (26)
			$p = 0{\cdot}008$	
Vitamin Days 1 and 6	Rating	15 (18)	18 (36)	18 (36)
		$p = 0{\cdot}052$		
			$p = 0{\cdot}002$	
Date Day 7	Latency to attempt (min)		0·6	11·1
				$p = 0{\cdot}01$
	No. attempts		6	1·5
Yellow ball Day 6	Latency enter cage (min)	0·1	0·1	0·7
			$p = 0{\cdot}042$	
	Total time in (min)	7·0	3·9	3·0
		$p = 0{\cdot}052$		
			$p = 0{\cdot}03$	
	Median visit length (min)	0·5	0·3	0·2
			$p = 0{\cdot}008$	
	Time spent playing (min)	2·3	0	0
		$p = 0{\cdot}052$		
			$p = 0{\cdot}02$	

TABLE 4. ACTIVITY WATCHES IN THE HOME RUN AT 18 MONTHS. MEDIAN SCORES AND *P* VALUES BASED ON MANN-WHITNEY *U* TEST, 2-TAILED

Watch	Measure	Controls ($N = 4$)	SS ($N = 5$)	TS ($N = 6$)
Activity	No. boxes/½ min	2·8	2·1	1·7
			$p = 0{\cdot}032$	
	$\frac{>5}{>1}\%$	30	16	18
	% Sitting	9	13	28
			$p = 0{\cdot}038$	
Type of activity	% Eating	73	77	77
	% $R + T$ play	5	2	0
			$p = 0{\cdot}032$	
	% A/W play	2	0	0
	% Manipulative play	8	6	7

The separated groups tended to show less overall activity, and to be less active when active, than the controls, the difference between control and TS infants being significant for the former measure. Differences in the proportion of time spent sitting also indicated less activity in the separated infants, the difference between controls and TS infants being significant.

There were no significant differences in eating or in manipulative play, but social play was less frequent in the previously separated infants.

30-*Month mother–infant interaction* (*home runs*)

The data from routine watches on each mother–infant pair when the infant was 130 weeks (or the last watch before the infant reached this age) have been compared for 8 control infants and 6 separates (5 of the previously separated infants had lost their mothers by this age, and 2 separated infants had died). There were no differences in total time off, percentage half-min spent wholly more than 60 cm from the mother (< 60 cm only) or in %Ap.–%L. Rejections were too infrequent by this age for comparisons to be made. Median scores for the controls and separates respectively were as follows: Time off: 100% and 100%; > 60 cm only: 64% and 46%; %Ap.–%L: 4 and 13%.

Thus by 30 months, when the role of the mother was in any case considerably reduced, there were no significant differences in mother–infant interaction.

30-*Month activity watches* (*home runs and indoor cages*)

Data on 8 control, 5 SS and 5 TS infants were collected in the home run, in the monkey room cage on the day the animal was moved up (beginning immediately it was released into the cage on Day 0), and on Days 1 and 5. The watch in the home run was begun at 10.00 hr. All watches lasted 2 hr (Table 5).

TABLE 5. ACTIVITY WATCH DATA AT 30 MONTHS. MEDIAN VALUES WITH p VALUES BASED ON THE MANN-WHITNEY U TEST, 2-TAILED

Watch	Measure	Controls ($N = 8$)	SS ($N = 5$)	TS ($N = 5$)
Activity Home run	No. boxes/½ min	3·1	2·4	2·5
			$p = 0{\cdot}012$	
	$\frac{>5}{>1}\%$	42	36	28
	% Sitting	23	27	35
			$p = 0{\cdot}020$	
	% Eating	57	63	67
	% $R + T$ Social play	4	0	0
			$p = 0{\cdot}02$	
	% A/W Social play	1	0	0
			$p = 0{\cdot}14$	
	% Manipulative play	5	11	13
			$p = 0{\cdot}01$	
Activity Indoor cage Day 0	No. boxes/½ min	1·8	1·5	1·6
	$\frac{>5}{>1}\%$	7	11	8
	% Sitting	92	91	97
	% Eating	15	14	8
	% Manipulative play	9	12	6
	No. whoos	47 ($N = 6$)	12	0
			$p = 0{\cdot}042$	
Activity Indoor cage Day 1	No. boxes/½ min	2·19	2·1	2·4
	$\frac{>5}{>1}\%$	27	23	26
	% Sitting	51	83	73
	% Eating	27	31	37
	% Manipulative play	5	11	19
			$p = 0{\cdot}014$	
	No. whoos	17 ($N = 6$)	24	43
Activity Indoor cage Day 5	No. boxes/½ min	3	3·8	3·3
	$\frac{>5}{>1}\%$	48	53	42
	% Sitting	50	62	44
	% Eating	48	40	40
	% Manipulative play	6	20	31
	No. whoos	14 ($N = 6$)	29	49
			$p = 0{\cdot}02$	

In the home run. The TS infants were significantly less active than the controls on a number of measures (No. of boxes/half min, % sitting, social play) and the SS infants had a higher manipulative play score. The SS infants generally had intermediate scores between the control and TS infants.

In the indoor cage on the day the animals were moved (Day 0). There were no significant differences in activity measures. The SS infants distress-called significantly more than the TS infants.

In the indoor cage on Day 1. The only significant difference was that the TS infants showed more manipulative play than the controls.

In the indoor cage on Day 5. The only significant difference was that the TS infants whoo-called more than the controls, thus reversing the relationship between their scores between Days 0 and 5 ($p < 0{\cdot}005$, Fisher exact test).

Summary and discussion. In the home runs the previously separated infants still tended to be less active (by several measures) and to show less social and more manipulative play than the controls. In the relatively strange indoor cages the number of differences which were significant was small. This was partly due to progressive changes which occurred after the move. On the first day locomotor activity was low in all groups, and whoo-calling was also depressed in the previously separated groups. Subsequently the controls called less and the previously separated infants more than they had done on the first day. The locomotor activity of the previously separated infants then tended to be higher than that of the controls, but the difference was not significant.

30-*month tests* (*indoor cage*)

Data were available for 8 controls, 5 SS and 7 TS infants (Tables 6 and 7).

Umbrella test. On Days 3 and 7. An umbrella was opened twice at the infant, and activity in the next 10 min recorded. Whereas there were significant differences between the groups in the first trial, there were none on Day 7. The 2 trials have thus been considered separately. On Day 3 the SS infants were less active in the 10 min after the umbrella had been opened than either the controls or the TS infants, having a significantly higher latency to move than the controls and a significantly higher percentage sitting score than the TS infants. On Day 7 the differences were in the same direction, but not significant.

Mask. On Days 2 and 6 activity was recorded for 10 min after the animals had been shown a person wearing a grotesque mask for 1 min. There were no significant differences in the latency to move after the person had gone, the number of boxes/half-min or the number of half-min in which the animal sat.

Standing looking and threat test. This involved 2 experimenters in turn standing in front of the cage passively for 1 min and then with threatening jerks for 1 min. It was performed on Days 1 and 5. The total number of threat noises and jerks were calculated for each animal for both minutes, both experimenters and both trials. In addition in each minute of each test the animal was rated on scales (0–3) for the amounts of chewing and champing shown. The scores for chewing and champing for all tests have been added for each animal in this analysis. There were no significant differences in the numbers of threat noises or jerks. The rating for chew/champs was significantly greater for the TS infants than for the controls or the SS infants.

Banana pre-test training. Banana was offered by Y.S.–B. twice on Day 2, and once on Days 3, 5 and 6. Rating was as in the vitamin tests. Although the separated infants were less ready to come than the controls, none of the differences were significant.

Vitamins. Pills were offered by Y.S.–B. on Days 1 and 5. The controls were significantly more ready to come than either the SS or TS infants.

Offering and withholding banana. On Day 3 and Day 7 the monkey was offered a piece of banana just outside the cage, but not allowed to reach it, for 5 min. The number of times the animal tried to take the banana (i.e. put its hand out towards it) was scored. There were no significant differences.

Choice board. A piece of apple was placed in one of 7 cups in a board, all cups were covered with a piece of sheet metal and the board placed in easy reach of the animal. After initial training on Day 7 during which the animal had the opportunity to learn the procedure in easy stages, 10 trials were run on Days 8, 9, 10 and 12. On Days 13 and 14 a 10-sec delay was introduced between covering the apple in the hole and putting the board within reach. However, the performance of all groups on these 2 days was so similar that the data for the delay trials have been omitted from the analysis.

The number of trials in which the animals made a correct first attempt, and the number on which they made no attempt, were calculated for each day and the groups compared on the sums of their ranks over the 4 days (Table 6). There were no differences between groups in the number of trials in which they made no attempts, or in the number in which they succeeded after the first attempt. The separated infants made fewer correct first attempts than the controls (significant for TS infants).

Banana in box. A clear plastic box containing a banana and tied round with string was put in the cage until the monkey had obtained the banana, or until 30 min had elapsed, on Days 12, 13, 14 and 15. When the four trials were considered together using the sums of the ranks on each trial there were no significant differences between the groups in the latency to attempt to open the box. However, on the fourth trial the TS infants took significantly longer to attempt than the controls (Table 6). There were no significant differences between groups in the time taken to succeed by the animals which did open the box, or the persistence of the animals which failed to do so (not shown in Table 6). Whereas the proportion of control animals which succeeded in opening the box increased slightly from the beginning to the end of the series (4/8–6/8), that of the TS animals decreased somewhat (6/7–4/7); 2/5 SS infants succeeded in both the first and last trial.

Date-out-of-reach. A piece of date was hung in reach on Day 1 and out of reach on Days 2 and 6 (Table 7). Observations were made for 30 min on Days 2 and 6. Too few separated animals attempted this test for the SS and TS groups to be analysed separately. Some animals only attempted in the first and some only in the second trial, so the 2 trials have been considered separately (Table 7), using only the animals which attempted at all in each trial.

Separated animals had a significantly longer latency to attempt in both trials. In the first trial they spread their attempts over a significantly shorter time span (within the 30 min available) and made significantly fewer attempts.

Summary. The differences between the experimental and control groups were much

TABLE 6. TESTS IN INDOOR CAGES AT 30 MONTHS. MEDIAN VALUES WITH SUMS OF RANKS IN SUCCESSIVE TRIALS IN BRACKETS. p VALUES BASED ON MANN-WHITNEY U TEST 2-TAILED

Test	Measure	Controls ($N = 8$)	SS ($N = 5$)	TS ($N = 7$)
Umbrella Day 3	Latency to move (½ min)	2	> 20	1
			$p = 0{\cdot}046$	
	No. boxes/½ min	3·4	1·0	3·5
	% Sitting	80	100	70
				$p = 0{\cdot}018$
Day 7	Latency to move (½ min)	1	2	1
	No. boxes/½ min	4·1	2·6	6·2
	% Sitting	85	100	55
Mask Days 2 and 6	Latency to move (No. ½ min)	4 (24)	3 (18)	3 (20)
	No. boxes/½ min	2·2 (25)	2·6 (13)	3·2 (16)
	No. ½ min in which sat	31 (23)	33 (23)	28 (14)
Standing/looking and threat test (R.A.H. and Y.S–B.) Days 1 and 5	Total no. jerks	61	73	48
	Total no. threat noises	42	78	17
	Chewing; total rating	10	11	22
			$p = 0{\cdot}02$	
				$p = 0{\cdot}046$
Banana pre-test training Days 2(2) 3, 5, 6	Total rating	14 (27)	24 (61)	29 (80)
Vitamins Days 1 and 5	Total rating	7 (16)	9 (25)	11 (31)
			$p = 0{\cdot}046$	
				$p = 0{\cdot}02$
Offering and withholding banana Days 3 and 7	Total no. attempts	10 (18)	11 (22)	0 (35)
Choice board Days 8, 9, 10, 12	No. trials correct at first attempt	22 (16)	4 (45)	13 (43)
			$p = 0{\cdot}04$	
	No. trials no attempt made	4 (35)	16 (59)	1 (25)
Banana in box	Latency to attempt (Trial 4) (min)	0·1	5·2	0·8
			$p = 0{\cdot}028$	
	Latency to attempt (all trials) (min)	0·78 (29)	11·3 (50)	1·95 (44)

TABLE 7. DATE OUT OF REACH. MEDIAN VALUES FOR EACH GROUP WITH p VALUES BASED ON MANN-WHITNEY U TEST, 2-TAILED

Test	Measure	Controls ($N = 5$)	SS + TS ($N = 5$)
Date out of reach			
Trial 1	Latency to attempt (min)	0·9	17·5
		$p = 0·008$	
	Time from first to last attempt (min)	16·7	0·05
		$p = 0·008$	
	No. attempts	3	1
		$p = 0·016$	
		$N = 4$	$N = 7$
Trial 2	Latency to attempt (min)	0·3	13·9
		$p = 0·012$	
	Time from first to last attempt (min)	3·69	0·35
	No. attempts	5	2

less marked at 30 months than at 12 months. The smaller number of tests which gave significant differences was in part due to the smaller number of animals available, but there was also probably a real diminution in the effect of the separation with time. Nevertheless, all those differences between controls and previously separated animals which were significant were in the direction of poorer or more "disturbed" behaviour by the latter.

DISCUSSION

In this paper data on rhesus mother–infant interaction, on infants' behaviour while off their mothers, and on infants' behaviour in a variety of simple experimental tests, have been compared between infants which had and had not previously had one or two 6-day periods of separation from their mothers. The interpretation of such data inevitably comes up against the difficulty that in any test or observation period there are an infinite number of measures which could be taken, so that some differences are likely to be significant by chance. Our reasons for selecting the measures we did use are largely set out in a previous paper (Spencer-Booth and Hinde, 1969): the selection was made before the analysis carried out here. An additional reason indicating that the differences found cannot be ascribed merely to chance is that they are very nearly all in the direction of indicating more disturbed behaviour on the part of the previously separated animals.

The tests indicate that the effects of a brief period of separation from the mother are still apparent months and even years later. At 12 months of age, 5 months after the separation experience, there were some indications that traces of the greater "dependence" of the infants which was seen immediately after the separation experience still remained. The previously separated infants tended to spend less time at a distance from their mothers in both home run and indoor cage, and to play a greater relative role in maintaining proximity with her, than the control infants which had had no separation experience, though few of the differences were significant. There were also indications that the locomotor activity of the previously separated infants was still somewhat depressed in comparison with the controls, though too few controls were tested for all the differences to reach statistical significance. In tests involving approach to strange objects in the home run there were no significant differences between the groups, but the previously separated groups were markedly less ready to take vitamins from an experimenter. The clearest differences were obtained when the infants' responses to strange objects or mildly frustrating situations were assessed in a strange cage. In this case the previously separated infants were less ready to approach on a large number of measures, the differences on a high proportion of the measures being significant. Furthermore those infants which had had two previous separation experiences were more different from the controls than were those which had had only one on the great majority of measures.

At 18 months the differences in activity measures still persisted.

At 30 months, 2 years after the separation experience, there were, as might be expected, no significant differences in the measures of mother–infant interaction, though the separates still tended to stay nearer their mothers and to play a greater part in maintaining proximity to her than the controls. The separated infants were still less active in the home run than the controls on a number of measures, with the infants with only one separation experience occupying a position intermediate between the controls and those which had had two. In the indoor cages these differences tended to disappear, and there were complex day-to-day changes in the activity measures. After the first day in these cages, however, the previously separated groups gave more whoo-calls than did the controls. In the tests at 30 months the previously separated infants were either less ready to approach strange objects or more disturbed by mildly frightening situations than the controls in a number of tests. Although there were no differences in the opposite direction, the effect of the separation experience was much less apparent than it had been at 12 months.

In summary, the effects of a separation experience of only 6 days were still clearly present 5 months later. Although the behaviour of the previously separated infants could still be said to lie within the normal limits, comparison with controls indicated some persistence of those symptoms of depression and of disturbed mother–infant relations which had been conspicuous in the month immediately following the mother's return. The differences from the controls in their responses to strange objects were apparent only when mother and infant were moved to a strange cage. At 30 months the consequences of the separation experience, as manifested by differences from the control animals, were still present, being similar in kind but much less marked than they had been at 12 months.

SUMMARY

Data on mother–infant relations, activity, and behaviour in test situations were obtained from rhesus infants, age 12 and 30 months, which had had one or two 6-day separation experiences when 20–32 weeks old, and from non-separated controls. At 12 months the previously separated infants showed less locomotor activity than controls, and some difference from them in mother–infant relations. There were no significant differences in their readiness to approach strange objects in the home pen, but marked differences when they were tested in a strange cage. At 24 months some differences were still present.

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THE EFFECTS OF OWN-HOME AND INSTITUTION-REARING ON THE BEHAVIOURAL DEVELOPMENT OF NORMAL AND MONGOL CHILDREN

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INTRODUCTION

INSTITUTIONAL rearing of children has long been recognized as less satisfactory for the child's development than growing up in a home. While early studies of the effects of institution-rearing on child development depended on retrospective analysis, or were limited to qualitative descriptions and to measurements of I.Q. and personality characteristics made in testing situations (e.g. Bowlby, 1951, for normal children; Centerwall and Centerwall, 1960; Stedman and Eichorn, 1964, for mongols), more reliance has recently been placed on direct observation of the child's behavioural development: for example, the development of social behaviour (Ambrose, 1961; Rheingold, 1961), and of manipulative behaviours (Provence and Lipton, 1962; White and Held, 1966). The conditioning of children's behaviour in lifelike situations suggests that the conditions of rearing should be studied (Bijou, 1965; Rheingold, 1961); so too does the improvement that follows the provision of a more stimulating environment (e.g. Lyle, 1959, 1960; Provence and Lipton, 1962; Rheingold, 1956; Skodak, 1968).

In more recent years conceptual sophistication has demanded a careful analysis of the conditions that contribute to favourable development (Ainsworth, 1962; Yarrow, 1964). Institutional environments must be described (e.g. David and Appell, 1961; Rheingold, 1961) for differences between institutions may affect the child's development (Butterfield and Zigler, 1965; Dennis, 1960; Zigler and Williams, 1963), as do different conditions of hospitalization (Schaffer, 1965). The institutional variable cannot, therefore, be used indiscriminately; where it has been, conflicting results have been obtained (see Rheingold's, 1961, findings with those of Provence and Lipton, 1962).

The direct observation of children reared under different conditions has been largely confined to normal children. The few studies on mentally retarded children rely on standard test procedures for assessing personality and intellectual development (Centerwall *et al.*, 1960; Lyle, 1959, 1960; Stedman *et al.*, 1964). The purposes of this study, therefore, were (i) to outline briefly the pattern of development of play behaviour, in a familiar environment, by normal and mongol children, and (ii) to use this outline of development as a basis on which to compare the effects of home-

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TABLE 1. NUMBER OF CHILDREN (a) IN EACH AGE GROUP; (b) AT EACH DEVELOPMENTAL LEVEL

(a) Age groups

Mongol subjects	5 mth–1 yr	1 yr 1 mth–1 yr 9 mth	1 yr 10 mth–2 yr 6 mth	2 yr 7 mth 3 yr–3 mth	3 yr 4 mth 4 yr
Home-reared mongols	9	10	12	8	4
Institution-reared mongols	6	4	7	11	8

Normal subjects	4–5 mth	6–8 mth	9–11 mth	1 yr–1 yr 3 mth	1 yr 4 mth–1 yr 8 mth	1 yr 9 mth–2 yr
Home-reared normal children	8	10	5	7	6	5
Institution-reared normal children	6	4	6	4	5	4

(b) Developmental level (and approximate mental age)

	II, II–III (1½–5 mth)	III, III–IV (6–9 mth)	IV, IV–V (10–12 mth)	V (13–15 mth)	V, V–VI (16–24 mth)
Home-reared mongols	7	9	7	5	16
Institution-reared mongols	5	12	8	8	3
Home-reared normal children	9	8	7	9	10
Institution-reared normal children	7	6	5	5	6

and institution-rearing on this behaviour. By using the same method of observation on both groups of children, the effects of institution-rearing on mongol and normal children could be compared.

METHOD

(a) *Subjects.* The subjects were four groups of children, whose distribution according to chronological age and developmental level (Woodward, 1959) is shown in Table 1.

I. Children diagnosed at birth as mongols, with a mental age of 2 yr and less and chronologically below 4 yr old:

  (a) home-reared
  (b) institution-reared.

II. Children under 2 yr old, regarded as normal at birth:

  (a) home-reared
  (b) institution-reared.

As no statistically significant differences were found between the behaviour of boys and girls in the two groups of home-reared children, data from boys and girls have been combined for the four groups of children under study.

(b) *The setting for the observations.* The caretaker was informed that the observer's interest was in the way in which the child occupied himself when left to play alone in his usual day environment; she was asked to carry on as nearly normally as possible. The observations were made by the author who sat in the corner of the room. Recording was not started until the subject began playing without paying undue attention to the observer; an analysis of the number of times that home-reared normal and mongol children was recorded as watching the observer showed it to be constant throughout the observation period, and of a similar order to that with which they watched other people.

(c) *The types of behaviour recorded.* These are shown in Table 2. Records were also made of the child being played with by, talked to by, or in physical contact with, another person.

(d) *Method of observation and its reliability.* Observations were made at intervals of 10 sec, and any of the behaviours listed in Table 2 occurring at these points in time were recorded. An observation session lasted 50 min giving a total of 300 observations for each child.

(e) *The testing technique.* The subject's developmental level was assessed using a brief test developed by Woodward (1959) which makes use of Piaget's (1953) scheme of sensori-motor development. This assigns a subject to one of six stages for which approximate mental ages are given (Table 1); as used by the observer the test yielded intermediate substages between adjacent pairs of each major stage.

The types of behaviour recorded, the testing technique employed, and the method of observation and its validation were the same as those described in detail elsewhere (Francis, 1970).

TABLE 2. CLASSIFICATION OF BEHAVIOUR ACCORDING TO INCIDENCE AT CHRONOLOGICAL AGES UP TO 4 YEARS FOR MONGOLS AND 2 YEARS FOR NORMAL CHILDREN†

	Category I Decreasing incidence of behaviours with increasing chronological age		Category II Similar incidence at all ages		Category III Increasing incidence of behaviours with increasing chronological age	
	Normal	Mongol	Normal	Mongol	Normal	Mongol
Diffuse movements						
	Head movements	Head movements				
	Mouth movements *	Mouth movements *				
	Arm movements *	Arm movements *				
	Hand movements	Hand movements				
	Finger movements *	Finger movements *				
	Leg movements *	Leg movements *				
	Foot movements *	Foot movements *				
Self-oriented behaviours						
	Chewing self	Chewing self *				
	Rubbing self	Rubbing self				
	Self-manipulation *	Self-manipulation *				
Postures‡						
	Hands clasped	Hands clasped *	Hand on face	Hand on face		
Object-oriented behaviours						
	Waving objects *	Waving objects *			Constructive play‖ *	Constructive play‖ *
			Throwing objects	Throwing objects		
	Chewing objects *		Tapping objects	Tapping objects		
			Instrumental tapping§	Instrumental tapping§		
		Rubbing objects	Rubbing objects	Chewing objects		Object manipulation *
			Object manipulation			
Movement						
					Locomotion *	Locomotion *
Visual attention¶						
	Blank staring *	Blank staring *	Watching observer	Watching observer	Watching objects *	Watching objects *
	Watching self	Watching self *	Watching other people	Watching other people		

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*An asterisk indicates that the corrrelation between the incidence of the behaviour and chronological age is significant at $p < 0.05$ (Kendall's correlation coefficient).

†Behaviours, the median occurrences of which were 1% of the observation session or less, were excluded.

‡Static positions of the hands.

§Tapping of an object or self with an object.

‖Sequence of behaviour, e.g. packing or unpacking a box of toys, winding up a watch.

¶The analysis of visual attention

RESULTS

I. *An outline of the development of play behaviour in home-reared mongols and home-reared normal children*

Three broad categories of behaviour were distinguished on the basis of the numbers of occurrences of each type of behaviour in the groups of children of different chronological ages. Some behaviours decreased in incidence with increasing age (Category I), others showed a similar level of performance at all ages (Category II) and yet others increased in incidence with age (Category III) (Table 2).

The behaviours of Category I included all the diffuse movements characteristic of an infant, blank staring, the self-oriented behaviours, and watching self. The behaviours of Category II were most of the simple object-oriented behaviours. Occurring at a fairly constant level throughout the age range considered, they represented important components of the child's means of exploring and manipulating the external world. Category III included the more complex behaviours requiring greater skill than the behaviours of Categories I and II, and visual attention to objects.

The differences between normal and mongol development were explored by comparing the children equated on the basis of developmental level (Table 1b). The numbers of performances of each type of behaviour by normal and mongol children at the same developmental level were compared on the Mann-Whitney *U*-test. Several differences were found: at all developmental levels diffuse movements (with the exception of mouth movements), occurred with greater frequency among normal than among mongol children, while self-oriented behaviours (particularly chewing and sucking self) were generally less frequent. For the two highest developmental groups locomotion was more frequent among normal than among mongol children. In object-oriented behaviours, the normal children were more active than the mongols at all developmental levels except the highest. The abrupt contrast between developmental levels V (mental age about 12–15 months) and V–VI, VI (above 15 months) was probably associated with the significant difference in locomotion between the two groups at this developmental level.

There were two more small differences between the two groups. The normal child generally paid more attention to the observer's presence than did the mongol; however, the difference between the groups was only significant at the $p < 0{\cdot}05$ level on the Mann-Whitney U test at developmental levels of 6–9 months, when normal children spent 27·7 per cent of the first 21 min of the observation session watching the observers, and the mongols 5 per cent. This difference suggested that the normal child was more alert than the mongol in noticing, and sustaining attention to, changes in his environment. There were no consistent differences between the groups in the other foci of attention.

The second difference was found by analysing the duration of behaviour episodes. The mean length of the behaviour episode was calculated for each child by total number of occurrences/total number of episodes, where an episode was any occurrence, or series of consecutive occurrences of a behaviour, and separated from the next episode by observations during which the behaviour was not seen. As the episode length is related to the number of occurrences, the analysis was confined to behaviours occurring 10–20 per cent of the observation session. A significant difference was found for object-oriented behaviours only; they occurred over 1·41 observations for normal children and over 1·54 for mongols, who were thus more persistent in exploring or using an object in a particular way before embarking on another type of behaviour.

II. *Comparison of home- and institution-rearing for mongols*

(a) *Differences between home- and institution-reared mongols of the same chronological ages.* The two groups were compared for each type of behaviour, each chronological age group being treated separately, and the differences being tested for significance at the $p < 0{\cdot}05$ on the Mann-Whitney U test. Those behaviours involving diffuse movements and most of the self-oriented activities (Category I behaviours that decrease in incidence with increasing age) generally occurred more frequently among institution-reared mongols than among home-reared mongols. On the other hand, the institution-reared mongol generally performed less frequently than the home-reared mongol those object-oriented behaviours that increased significantly in incidence with age (Category III behaviours).

These results could be interpreted as indicating that the institution-reared mongols were more retarded than the home-reared mongols.

(b) *Developmental levels of home- and institution-reared mongols.* Regression lines showing the relationship between developmental level and chronological age were drawn for the home- and institution-reared mongols (Fig. 1). Both these regression lines and those relating locomotor and chronological age (Fig. 2) for the two groups showed the institution mongols to be more retarded than the home-reared mongols (significant at $p < 0{\cdot}02$ and $p < 0{\cdot}05$, respectively).

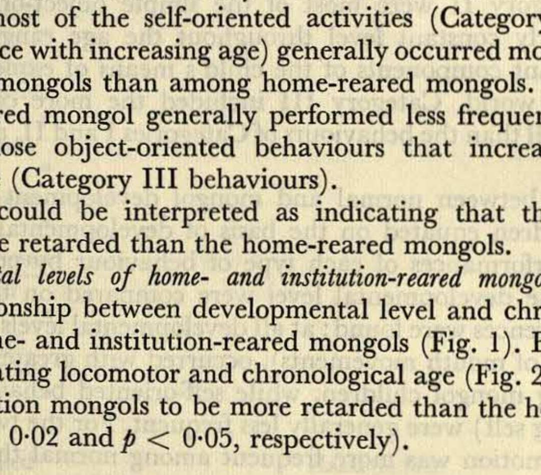

FIG. 1. Regression lines showing the relationship between developmental level and chronological age for home- and institution-reared mongols. (Solid line and dots refer to home-reared children; broken line and crosses to institution-reared children.)

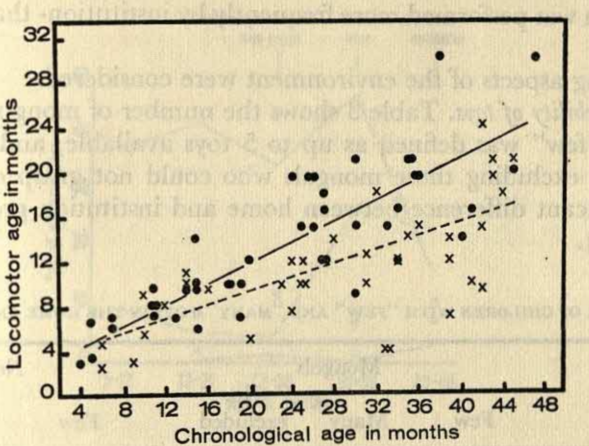

FIG. 2. Regression lines showing the relationship between locomotor and chronological age for home- and institution-reared mongols. (Symbols as in Fig. 1.)

To examine the extent to which the behavioural differences between home- and institution-reared mongols could be explained in terms of the latter's lower developmental level, the comparison between the incidence of different behaviours that was made before on the basis of chronological age was repeated with reference to developmental level. The results of such a comparison were very little different from those found when the two groups of mongols were compared with reference to chronological age. (Furthermore, the differences in behaviour were reflected in the differences in the focus of visual attention by the two groups of mongols. The home-reared mongols were more attentive to the toys with which they were playing than were the institution mongols, while institution mongols looked more at themselves and exhibited more blank staring than the home-reared mongols.) It thus appeared that differences in the behaviour of home- and institution-reared mongols were not due to the retardation of the institution-reared mongol.

(c) *Environmental factors influencing the behaviour of home- and institution-reared mongols.* A factor that might be related to the behavioural differences between home- and institution-reared mongols was suggested by the differences between the two groups for object-oriented behaviours. Object-oriented behaviours like chewing, waving, throwing, and instrumental tapping which usually involve small objects, were all less frequent among institution-reared mongols than amongst home-reared mongols. On the other hand, tapping and rubbing, which can be directed towards any object, irrespective of size, were more typical of the institution- than the home-reared mongols. This difference suggests that the availability of small toys for the mongol to play with might be responsible for the home-institution differences. In the absence of toys a mongol performed what object-oriented behaviours he could, like tapping and rubbing furniture, and otherwise filled his time with activities that were typical of a younger mongol (Category I behaviours) or evolved behaviours which, like some of the Category I behaviours, were unrelated to the external world but which reflected the older child's neuromuscular development. An example of such behaviour is rocking, which was performed more frequently by institution- than by home-reared mongols.

The following aspects of the environment were considered.

1. *The availability of toys.* Table 3 shows the number of mongols with "few" and "many" toys; "few" was defined as up to 5 toys available, and "many" as more than this. After excluding those mongols who could not grasp on sight, a χ^2 test showed a significant difference between home and institution groups ($\chi^2 = 10{\cdot}95$, *df* 1, $p < 0{\cdot}001$).

TABLE 3. NUMBER OF CHILDREN WITH "FEW" AND "MANY" TOYS IN THE HOME AND INSTITUTION GROUPS

	Mongols			Normal children		
	Few	Many	No. excluded	Few	Many	No. excluded
Home-reared	11	27	5	4	30	9
Institution-reared	21	11	4	5	20	4

2. *The use of physical restraint.* Restraint was assessed by comparing the locomotor ability of the mongol with the extent to which this ability could be fully exploited. A mongol was regarded as restrained if he was able to walk or crawl and was left in a cot, playpen or chair for more than a quarter of the observation session. After excluding those children not yet able to locomote in any way, a significant difference was found between home and institution groups (Fisher test, $p < 0{\cdot}02$). The numbers of mongols restrained and unrestrained are shown in Table 4.

TABLE 4. NUMBER OF CHILDREN RESTRAINED IN HOME AND INSTITUTION GROUPS

	Mongols			Normal children		
	Restrained	Not restrained	No. excluded	Restrained	Not restrained	No. excluded
Home-reared	3	26	14	2	25	16
Institution-reared	8	13	15	3	13	13

3. *The amount of social contact received.* The three categories of social interaction that were recorded provided a measure of the amount of attention paid to the mongol by other people.

Figure 3 shows the occurrence of all categories of social interaction in each chronological age group for home- and institution-reared mongols. Except in the oldest age group institution mongols received consistently less social contact than the home-reared mongols, although only one of the age groups showed a statistically significant difference ($p < 0{\cdot}05$ on the Mann-Whitney U test). The difference in the amount of social contact received by the two groups of mongols may reflect the fact that mothers on the whole were able, and probably more inclined, to spend more time with their children than the nurses were. They were also more available for the older child to approach.

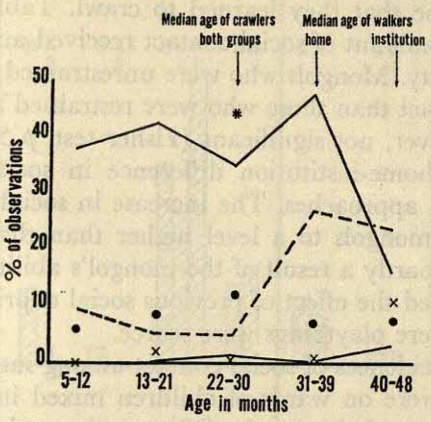

FIG. 3. Percentage of observation session occupied by social contact at different chronological ages for home- and institution-reared mongols.
Dots and crosses give the median percentages of the observation session occupied by social contact for each group of home-reared and institution-reared children respectively, and solid and broken lines give maximum and minimum percentages for home- and institution-reared children respectively. (The minimum percentages for institution-reared children are all zero.) The asterisks indicate at which developmental levels there are significant differences between the two groups ($p < 0{\cdot}05$ on the Mann-Whitney U test).

Factors influencing the amount of social contact received. Ability and opportunity for locomotion were also important in determining the amount of social contact a mongol received. The difference in the amounts of social contact received by all those institution-reared mongols able to locomote and by those unable to do so is shown in Table 5 and was statistically significant (Fisher test, $p < 0{\cdot}006$). Social contact increased among institution-reared mongols when crawling was well established, and walking was beginning (see Fig. 3). The home-reared mongols, on the other hand, received a fairly constant amount of social contact at all ages, with a slight

TABLE 5. AMOUNT OF SOCIAL CONTACT EXPERIENCED BY INSTITUTION-REARED MONGOLS WITH DIFFERENT CAPACITIES AND OPPORTUNITIES FOR LOCOMOTION

	Percentage of the observation session occupied by social contact	
	0–5%	> 5%
Unable to locomote	13	1
Able to locomote but restrained	5	3
Unrestrained and able to locomote	5	8

increase at about the time that they learned to crawl. Table 5 also indicates the relationship between the amount of social contact received and the opportunity for exercising locomotor ability. Mongols who were unrestrained and able to locomote received more social contact than those who were restrained and able to locomote; this difference was, however, not significant (Fisher test, $p > 0{\cdot}05$). These points suggest that the major home-institution difference in social contact lies in the number of other-initiated approaches. The increase in social contact in the oldest age group of institution mongols to a level higher than that of the home-reared mongols may have been partly a result of the mongol's ability to approach others, but may also have reflected the effect of previous social deprivation or the absence of anything else to do where playthings were scarce.

More of the higher incidences of social contact among institution mongols were recorded for those who were on wards of children mixed in mental and chronological age than for those on baby wards. Of mongols receiving social contact for only 0–5 per cent of the observation session 3/23 were on mixed wards, while of those receiving more than 5 per cent, 11/12 were on mixed wards (Fisher test, $p = 0{\cdot}002$). This suggests that in a mixed group of retardates there was a greater amount of child–child contact, and that nurses were stimulated to take more interest in the children by the greater contrast between them than was found on a ward where all the children were very similar.

The conclusion then was that the more retarded level of development in the institution-reared mongols could not be regarded per se as responsible for the differences in behaviour between the home- and institution-reared mongols. Differences between the environments in which these two groups were brought up have been demonstrated; the next section shows that these differences could have been linked to differences in behaviour.

(d) *The effect of altering environmental conditions on the behaviour of the institution-reared mongol.* Four cases were found in the observer's records for institution-reared mongols, of a period of restraint preceded or followed by one during which the mongol was unrestrained. The behaviour of the mongol for 18 min before and after restraint was compared with that observed during 18 min of restraint. With the removal of restraint, diffuse movements and self-oriented behaviours (Category I behaviours) decreased in their frequency of occurrence, and locomotion and object-oriented behaviours increased. The number of subjects was, however, too small to regard this as a conclusive finding.

The records were also searched for instances of the institution-reared mongol experiencing social contact for at least 2 min in the course of a 6-min period. The mongol's behaviour was then examined for this 6-min period, and compared with the preceding and succeeding 6-min periods which were without social contact. Figure 4, upper left, shows that social contact had a differential effect on different aspects of the mongol's behaviour. Like release from restraint, it stimulated the more organized and advanced behaviours (object-oriented behaviour and locomotion) and suppressed the occurrence of the more infantile ones (self-oriented behaviours and diffuse movements); the institution mongol's behaviour thus became more similar to home-reared mongol's than it usually was. Object-oriented behaviours decreased during the first 6-min period following social contact, but increased

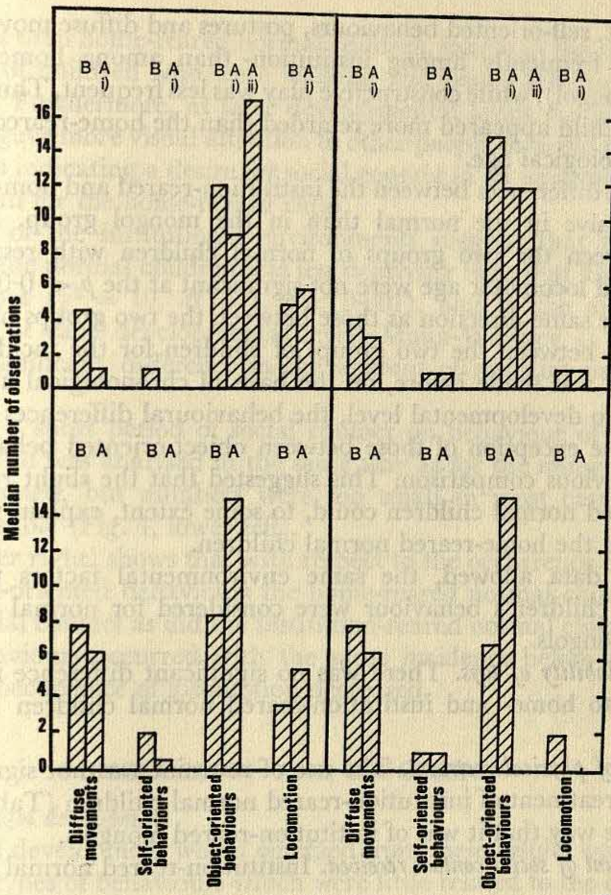

FIG. 4. Median number of observations of different behaviours before (B) and after (A) social contact in (upper left) institution-reared mongols; (A_i indicates the first 6-min period following social contact and A_{ii} the second); (upper right)—home-reared mongols; (lower left)—institution-reared normal children; and (lower right)—home-reared normal children.

significantly during the second ($p < 0{\cdot}03$). For the other types of behaviour, the greater increase or decrease in incidence occurred during the first 6-min period following social contact.

It should be noted that social contact with home-reared mongols produced less behavioural change than did social contact with those reared in institutions, and that the direction of change in the incidence of object-oriented behaviour was opposite in the two groups. The difference in responsiveness between them is, however, significant for locomotion only (Mann–Whitney U test, $p < 0{\cdot}05$).

III. *Comparison of home- and institution-rearing for normal children*

Differences between home- and institution-reared normal children were analysed as for the two groups of mongols. When the two groups were compared on the basis of chronological age certain similarities were apparent in the behaviour of institution-reared mongols and institution-reared normal children when compared with their home-reared counterparts.

For example, self-oriented behaviours, postures and diffuse movements generally occurred more frequently among institution- than among home-reared children (normal and mongol), while constructive play was less frequent. Thus, the institution-reared normal child appeared more retarded than the home-reared normal child of the same chronological age.

However, the differences between the institution-reared and home-reared children were less extensive in the normal than in the mongol group. Futhermore, the difference between the two groups of normal children with respect to developmental level and locomotor age were not significant at the $p < 0.05$ level, although they were in the same direction as those between the two groups of mongols. When the comparison between the two groups of children for the incidence of different behaviours that was made before, on the basis of chronological age, was repeated with reference to developmental level, the behavioural differences between the two groups (with the exception of those between object-oriented behaviours) were less than in the previous comparison. This suggested that the slight retardation of the institution-reared normal children could, to some extent, explain their behavioural differences from the home-reared normal children.

Where the data allowed, the same environmental factors that might have influenced the children's behaviour were considered for normal children as were analysed for mongols.

1. *The availability of toys.* There was no significant difference in the number of toys available to home- and institution-reared normal children (Table 3—Fisher test, $p < 0.2$).

2. *The use of physical restraint.* The use of restraint was not significantly characteristic of the treatment of institution-reared normal children (Table 4—Fisher test, $p < 0.2$) in the way that it was of institution-reared mongols.

3. *The amount of social contact received.* Institution-reared normal children received

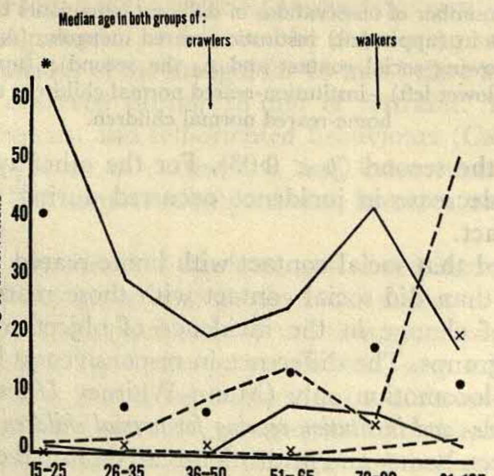

FIG. 5. Percentage of observation session occupied by social contact at different chronological ages for home- and institution-reared normal children. (Symbols as for Fig. 3).

less social contact than home-reared normal children, except in the oldest age group, which consisted of children who were walking and hence able to seek out social contact (Fig. 5). Furthermore, at later developmental levels the institution-reared normal children gave more visual attention to other people than did the home-reared children, perhaps indicating a desire for social contact in an environment where less was available than for the home-reared child.

Examination of the institutional environments suggests that the institutional environment for the normal children was less depriving than that for mongols in the availability of toys ($\chi^2 = 10$, $df = 1$, $p < 0{\cdot}001$), and in the amount of social contact received at each developmental level (Mann-Whitney U test, $p < 0{\cdot}05$). There was no significant difference in the amount of restraint used (Fisher test, $p = 0{\cdot}13$).

The effect of a short period of social contact on behaviour of the institution-reared normal child was analysed in the same way as for the mongol. Very similar results were obtained, but numbers were too small in most cases for statistical analysis to be possible (Fig. 4, lower left).

Figure 4 (lower right) shows that with respect to the occurrence of diffuse movements and object-oriented behaviours the home-reared normal children responded to a period of social contact as did the institution-reared normal children. However, self-oriented behaviours occurred with the same incidence before and after social contact, and the occurrence of locomotion decreased.

CONCLUSIONS AND DISCUSSION

I. *Normal and mongol development*

The picture of development which emerged from these results was one in which the early, simple types of behaviours which were little related to the external world, were replaced by more organized behaviour. With the increasing organization of activity, a number of manipulatory behaviours appeared; they were at first directed at least in part to the child's own body, but later were oriented principally to the external world. This was also reflected in the changing focus of the child's visual attention as he grew older. The first object-oriented behaviours were relatively simple, limited in the movements that they involved and in their application. They contrasted with the more complex and variable behaviours of the older child, which at the upper end of the age range included sequences of behaviour imitated from adults.

Few others have used an approach similar to the one reported here that will allow a detailed comparison of findings. In discussing the mechanisms by which simple forms of behaviour are co-ordinated to produce more complex ones in normal children, Piaget (1953) mentions the behaviours observed in this study. He notes the incidence of movements of the mouth, arms, hand, fingers, head and legs from birth; sucking objects appeared from the third month of life, while in this study it was found to be particularly characteristic of the 4th–8th months. He describes the appearance of watching the movements of the child's own hands in the 4th month: here it was found to be most common in the 5th–8th months. Waving objects as an intentional act was noticed in the 4th month by Piaget, and was seen here to be most prevalent at 6–8 months; what has here been called constructive play was first noted by Piaget in the 16th month, and here at 12 months. Shirley (1931, 1933) recorded some behaviours that are comparable to those distinguished in this study. While there is some agreement between the behavioural development found by the two studies (e.g. in the appearance of constructive play and rubbing objects), there are also several differences (e.g. in the ages at which chewing objects and watching people and objects are most prevalent) for which no ready explanation offers itself.

Half the behaviours considered showed no difference between the normal and mongol children, underlining the basic similarity in behavioural development in these two groups. What differences there were suggested that at all developmental levels the normal children were more alert and active than mongols. This showed up at the earliest stages in the more frequent occurrences of arm, leg and finger movements, later in more active exploration of objects, and finally in more locomotion. The normal child was also more aware of the events going on around him, as evidenced by the attention that he paid to the observer, in contrast with the mongol, whose persistence in object play suggested an unawareness of ongoing events. These findings are in keeping with the slower reaction times and less marked responses that have been found typical of mental retardates (Baumeister and Kellas, 1968), particularly mongols (O'Connor and Hermelin, 1963); and with their slower learning in conditioning and discrimination tasks (House and Zeaman, 1962). These characteristics have been summed up in Macaulay and Macmillan's (1965) concept of "slowed-down" normality.

II. *The effect of institutional rearing upon normal and mongol development and behaviour*

Institution-reared normal and mongol children were behaviourally more retarded than their home-reared counterparts of the same chronological age, and the institution-reared mongols were significantly retarded developmentally. Developmental retardation of institution-reared normal children has been extensively reported (e.g. Ainsworth, 1962; Dinnage and Pringle, 1967; Yarrow, 1964), but was not found for the groups studied here. The retardation of the normal children was less marked than among mongol children; for example, the differences in the slopes of the regression lines of locomotor on chronological age are $0{\cdot}276–0{\cdot}260 = 0{\cdot}016$ for normal children, and $0{\cdot}451–0{\cdot}291 = 0{\cdot}16$ for mongols. The institution-reared mongols were retarded in both sensori-motor and locomotor development, particularly the former. Centerwall and Centerwall (1960) have found that mongols in institutions walk later than those living at home, and that at later stages there are significant differences between the two groups in intelligence and social quotients (see also Shipe and Shotwell, 1965; Shotwell and Shipe, 1964). Such findings have been criticized on the grounds that the more retarded individuals are more likely to be institutionalized (Birch and Belmont, 1961). However, of the 30 institution-reared mongols for whom information was available, 24 were institutionalized before the age of one year, at which age it is difficult to assess a mongol's potential for development. Figures 1 and 2 suggest that at early ages there was little difference between the home- and institution-reared mongols studied here.

The institution child's behaviour was characterized by a higher incidence of less mature behaviours, and a lower incidence of the more organized, advanced behaviours like locomotion and constructive play, than were found for home-reared children. The infantile behaviours resemble in many ways those described by Bender (1950), Schaffer and Callender (1959) and Skier (quoted by Dinnage and Pringle, 1967), and their prevalence contrasts with reports of apathy (Mittelman, 1954; Provence and Lipton, 1962; Spitz and Wolf, 1949), which is perhaps the result of more extreme environmental deprivation. The high incidence of diffuse movements and self-oriented behaviours may indicate the slow development of control over them and their integration for purposeful activity. If their performance becomes habitual it may seriously affect the child's interaction with his environment (Kagan and Lewis, 1965).

A lower incidence of object-oriented behaviours has also been noted among institution-reared children by Rheingold (1961) and by Provence and Lipton (1962), and it has been shown, as in this study, by the latter and by others (Rubenstein, 1967; Schaffer and Emerson, 1968) that social contact stimulates exploration of, visual interest in, and advanced use of, objects in normal children. Intensive mothering of severely retarded boys produced an increase in purposeful behaviour, and restrained thumb-sucking and diffuse, badly co-ordinated movements (McKinney and Keele, 1963). It thus seems that social contact is most important to a child's development. Furthermore, it is clear from this study and others (Skodak, 1968) that an institution child receives the maximum amount of social contact in a mixed group of children, and that group living for babies in a baby ward can be sufficiently damaging to justify recommendations against such arrangements (McCandless, 1964).

Social contact did not have the same effect on the behaviour of the home-reared child, especially the mongol, as it did on that of the institution-reared child; this was probably because the home-reared child was more accustomed to social interaction and was also functioning at a level nearer his maximum potential than the institution mongol. It could also have been due to differences in the nature of the social contact experienced by the two groups. There was a difference in the number of individuals with whom there was social contact: for the home-reared mongol most social interaction involved his parents and sibs, a stable group of people not exceeding half a dozen, while for the institution-reared mongol it involved many caretakers and other children, maybe 20 or more in any one day, and changing from day to day. This in turn meant a difference in the quality of the interaction for the two groups in terms of its affectional content, the range of stimulation provided and the encouragement of developing behaviours.

The behavioural differences between the two groups of mongols were not simply a reflection of the different developmental levels of the two groups of mongols, as a comparison of their behaviours with the two groups equated on the basis of developmental level showed as many differences as the comparison by chronological age. However, among the normal children the slight differences in developmental level did, to some extent, account for the behavioural differences between home- and institution-reared groups. It is suggested that the institutional environment was an important factor in producing developmental and behavioural retardation. The institution mongol had fewer toys available to him, was more likely to be restrained and, except when able to walk, experienced less social contact than home mongols;

the institution normal children received less social contact than the home normal children, except when able to walk. The paucity of toys available to the institution mongols might account for the latter's small amount of object-oriented play and retarded sensori-motor development (see Menzel, Davenport and Roger, 1963, and Schiller's, 1957, findings for chimpanzees). Stedman and Eichorn (1964) singled out as an area in which retardation is particularly apparent among institution mongols, the ability to use small objects. However, although the institution-reared normal children had good supplies of toys, they showed less object-oriented behaviour and less visual attention to objects than did home-reared normal children when compared on the basis of developmental level, and they were more retarded in their sensori-motor development.

SUMMARY

Early, simple types of behaviour that were little related to the external world were replaced by locomotion and manipulatory types of behaviour in both mongols and normal children (mental age below 2 yr). The manipulatory behaviours were at first oriented at least partly towards the child's own body, but later principally towards the external world. The focus of the child's visual attention at different ages reflected the changing incidence of different types of behaviour. Normal children were more active than mongols of the same developmental level, and paid more attention to ongoing events.

Behavioural differences were found for both mongols and normal children (mental age below 2 yr) between those who lived at home with their parents and those in institutitons: differences were evident in the frequency with which different types of behaviour were performed, and the distribution of visual attention to different factors in the environment.

The lower developmental level of the institution-reared children did not adequately account for these behavioural differences; it was suggested that factors such as availability of toys, use of restraint and amount of social contact, that distinguished the environments from one another, were related to the behavioural differences of the home- and institution-reared children. By altering the environmental conditions in the institutions to resemble more closely the home environment, the behaviour of the institution-reared children became more like that of the home-reared children.

The behavioural differences between home- and institution-reared mongols were greater than those between home- and institution-reared normal children; this might have been the result of the greater activity and alertness of normal children, or of the more depriving nature of the institutions for mongols than that of those for normal children. There were also differences between the care given to home-reared mongols and that given to home-reared normal children.

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Hospital, Bracknell, Berkshire; Botley Park Hospital, Chertsey, Surrey; Church Hill House Hospital, Easthampstead, Bracknell, Berkshire; The Grange, Hindhead, Surrey; Hortham Hospital, Almondsbury, near Bristol; Kenton House Nursery Home, Headley Down, Bordon, Hampshire; The Manor House, Frenchay, near Bristol; Queen Mary's Hospital for Children, Carshalton, Surrey; Stoke Park Hospital, Stapleton, Bristol.

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BEHAVIOUR PROBLEMS IN THE INFANT SCHOOL

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INTRODUCTION

SINCE 1968, the Schools Council Research and Development Project in Compensatory Education, based at the University College of Swansea, has been engaged on a number of enquiries involving infant school children in several areas of England and Wales. The main aims of the project, described in the Schools Council Field Report No. 6 (1968), are, in brief, firstly to provide screening techniques to enable children in need of compensatory education to be identified on entry to school; secondly, to make longitudinal studies of infant school children in "deprived" areas, with particular reference to their emotional development and response to schooling; and thirdly, to produce language materials which may be used to help deprived children at the infant school stage. As part of the work carried out in connection with the second of these three aims, information is being gathered about the incidence of behaviour problems in a number of infant schools serving catchment areas differing widely in socio-economic level, mainly to ascertain whether behaviour problems are more common, and more difficult to deal with, in schools in "deprived" areas than in areas where there is little or no evidence of deprivation. This information is being collected over a 3-yr period, and will be fully analysed at the end of this period, together with data obtained from intensive studies which are being made relating to the emotional development of selected sub-samples of children. This paper presents the results available for the total sample of children involved at the end of their second term at school. Assessments of the children's adjustment subsequent to those referred to above will be available later, and it will be of interest to see how these later results agree with the ones reported here. Pending the full analysis of all the data, no attempt is made here to give explanations for any differences between groups found in this enquiry.

DESCRIPTION OF SAMPLE

The urban sample of children in the general survey is taken from London and two local education authorities in Wales; the rural sample comes from one county in Wales. In each of the three urban areas the local education authority was asked initially to select four non-denominational infant-only schools serving catchment areas which could be described as "deprived" and four "control" schools serving predominantly "middle-class" and "settled working-class" areas. In the rural area, where this kind of division was not applicable, a representative sample of 11 schools was selected. At a later stage, in order to increase the sample of children in the "deprived" group, an additional school serving a deprived population was

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selected from two of the urban areas. In all, the sample consisted of 726 children attending 26 urban schools (14 serving "deprived" catchment areas and 12 serving "control" areas) and 11 rural schools. These children represent all those who entered school in September 1968 and whose date of birth fell between 1 September 1963 and 31 March 1964, except in one school with an intake of over 80 children, where pupils from only one of two reception classes were included, to ensure numbers more comparable with those in other schools.

The "deprived" areas in each of the four boroughs consist not only of conglomerations of old, dilapidated and usually overcrowded houses but also of council house estates, early and more recent, where various demographic data, including family size and the percentage of the population in the lower occupational classes, indicate at least relative deprivation. The "control" areas are almost entirely residential and their population statistics show a higher proportion of professional or "white-collar" occupations, more owner-occupiers and smaller families. Rateable values of private dwellings in these areas are also higher (considerably so in some cases).

The rural area chosen is a relatively small Welsh county, mainly agricultural and with only a small amount of light industry. The nearest large town (defining "large" as of sufficient importance to attract a branch of Marks and Spencer) is over 40 miles from some of the homes. Although four of the 11 schools are situated in an urban district, all of them serve a scattered community with some isolated farms up to eight miles or more from the school. Public transport services are minimal and the few towns within the county are fairly small, the population of the whole county being less than 20,000.

PROCEDURE

In order to collect data concerning the children's development, the project team has asked the teachers to complete specially-devised schedules at intervals during the 3-yr infant school period. In the third schedule, completed at the end of the children's second term in school (when the children were between 5 yr and 5 yr 7 mths), Stott's six adjustment pointers (Stott, 1966) were included. These pointers, although a fairly crude means of estimating the incidence of behaviour problems, inasmuch as they involve a mere "yes" or "no" to six questions, enable a general picture to be obtained of the number of children in a given school or class whose response is not altogether satisfactory to the teacher, and are very useful for screening purposes. In addition, an overall rating of the child's level of adjustment, based on that used by Schaefer as part of a Classroom Behaviour Inventory (unpublished to date) developed by him in the U.S.A., was asked for, and the head teachers and teachers were interviewed on the basis of prepared schedules, which included several items designed to elicit information on the problems faced by the schools in respect to emotional or behavioural difficulties shown by the pupils (see Appendix). At the time of writing, information was available from 34 head teachers and 48 class teachers.

INCIDENCE OF BEHAVIOUR PROBLEMS

Although there is an increasing emphasis on the need to identify behaviour disturbance at an early stage, there is little systematic evidence about the nature and incidence of such disturbance in the infant school. In the enquiry carried out in Birmingham (1953) for the Underwood Committee (Ministry of Education, 1955), 13·3% of 2264 boys and girls of 6–7 yr of age were rated as "very maladjusted" or "probably maladjusted" on the basis of school reports. Pringle *et al.* (1966), in the National Child Development Study, found that 13·4% of 9817 7-yr-olds scored 20 or more adverse points on the Bristol Social Adjustment Guide and were, in this sense, termed "maladjusted"; in addition, 22·6% scored between 10 and 19 points and were rated "unsettled". Webb (1967) found that out of 500 children who left an infant school in the South of England over a period of years, 80 (16%) presented their teacher with difficult problems of behaviour and learning. A report published by the California State Department of Education (1961) estimated that 6·1% of 57,374 kindergarten children showed emotional disturbance, of whom 1·1% were judged by their teachers to need psychiatric help and 5% to need more than their fair share of the teacher's time and attention. In the first grade, the incidence of disturbance had increased to 9·3%, of whom 2% were thought to need psychiatric help. It is very difficult to make comparisons between the various estimates reported, since different criteria of emotional and behavioural disturbance are used by different investigators, and, furthermore, it would seem that the chronological age of the children will have some bearing on the ratings, as younger children tend to be rated rather more tolerantly than older ones.

Overall results

Tables 1a and 1b show the overall results obtained from the teachers' responses to the six Stott questions. From Table 1a it will be seen that the teachers considered

TABLE 1a. OVERALL RESULTS—STOTT POINTERS ($N = 726$)

Questions	Results			
	Scoring adversely		Not scoring adversely	
	N	%	N	%
1 Is the child's behaviour such as you would expect of a normal alert child of his/her age?	74	10·19	652	89·91
2 Is the child exceptionally quiet, timid or withdrawn?	68	9·37	658	90·63
3 Is the child restless in a way that seriously hinders his/her learning?	65	8·95	661	91·05
4 Is the child very aggressive?	42	5·78	684	94·21
5 Does the child get on well with other children?	42	5·78	684	94·21
6 Is there anything in the child's behaviour to make you think that he might be emotionally unstable or suffer from nervous trouble?	76	10·47	650	89·53

TABLE 1b. OVERALL RESULTS—NO. OF STOTT POINTERS ($\mathcal{N}$ = 726)

No. of pointers scored	No. of children	%	Comparison with Stott (1963) 693 junior school children (%)
0	551	75·89	71·2
1	79	10·88	10·5
2	35	4·82	6·2
3	34	4·68	5·5
4	20	2·75	4·5
5	6	0·83	1·3
6	1	0·14	0·6

approximately 10% of the children to be showing some indication of emotional instability or nervous trouble (Question 6), and the same percentage not be be behaving in the way to be expected from a normal alert child of the age range considered (Question 1). It was of interest to see to what extent the same children were adversely rated on both Question 1 and Question 6. Of the 107 children (14·73%) out of the total sample rated adversely on one or both questions, only 39 in fact were adversely rated on both, 32 being adversely rated on Pointer 1 only, and 36 on Pointer 6 only. Clearly the two questions are not seen as similar, and indeed an adverse rating on Pointer 1 might indicate immaturity or retardation without "emotional instability or nervous trouble". Table 1b shows that as many as 24% scored at least one adverse pointer out of the six, 13% scoring at least two. As will be seen from Table 1a, withdrawn behaviour and restlessness were more common than aggressiveness. The results presented in Table 1b are very similar to those given by Stott (1963) for 693 junior school children.

TABLE 2. OVERALL RESULTS—SCHAEFER RATING ($\mathcal{N}$ = 726)

Rating of level of adjustment	$\mathcal{N}$	%
1 *Well adjusted:* a child who is well adjusted in his relationships with others and in his activities	259	35·67
2 *No significant problems:* a child who gets on reasonably well and has little or no difficulty in adjusting to others or to classroom activities	362	49·86
3 *Somewhat disturbed:* a child who has moderate difficulties in adjusting and to whom growing up represents something of a struggle	98	13·50
4 *Very disturbed:* a child who has, or at his present rate is likely to have, serious problems of adjustment and needs specialist help because of such problems	7	0·96

Table 2, which gives the overall results on the Schaefer rating, indicates that the teachers considered over 13% of the children to have difficulties in adjustment which amount to at least "moderate disturbance" and an additional 1% to be very disturbed and in need of specialist help. These figures are consistent with the estimate of the incidence of maladjustment (if one excludes the "unsettled" group) among 7-yr-olds quoted by Pringle *et al.* (1966), mentioned above.

TABLE 3. HEAD TEACHERS' ESTIMATES OF THE INDICIDENCE OF BEHAVIOUR PROBLEMS IN THEIR SCHOOLS

		Mild problems		Serious problems	
Type of school	*N*	Mean %	Range %	Mean %	Range %
Control	11	4·5	0–10·7	0·9	0– 4·4
Deprived	13	12·2	1–30	5·2	0–18·2
Rural	9	2.0	0–10	1·1	0– 7·7
Total	33	6·3	0–30	2·6	0–18·2

The head teachers were asked "*What percentage of your infant children do you estimate present* (*i*) *mild* (*ii*) *serious emotional, social or behavioural problems in school?*" Their overall estimates, relating to the infant school as a whole and based on their current intake of children, vary widely but on the average are somewhat below those obtained on the Stott pointers and the Schaefer rating (Table 3).

TABLE 4a. HEAD TEACHERS' RANKINGS OF TYPES OF PROBLEMS IN ORDER OF FREQUENCY OF OCCURRENCE IN SCHOOL

CA schools (*N* = 11)	DA schools (*N* = 13)	Rural schools (*N* = 9)	All schools (*N* = 33)
1 Nervousness (N)	1 R	1 R	1 R
2 Shyness (Sh)	2 Ag	2 Sh	2 Sh
3 Restlessness (R)	3 } Sh D	3 N	3 N
4 Aggressiveness (Ag)		4 Ag	4 Ag
5 Disruptiveness (D)	5 A-S	5 D	5 D
6 Anti-social (A-S) behaviour (Lying, stealing, destructiveness)	6 N	6 A-S	6 A-S

TABLE 4b. CLASS TEACHERS' RANKINGS OF TYPES OF PROBLEMS IN ORDER OF FREQUENCY OF OCCURRENCE IN CLASS

CA classes (*N* = 18)	DA classes (*N* = 19)	Rural classes (*N* = 11)	All classes (*N* = 48)
1 R	1 R	1 R	1 R
2 Ag	2 Ag	2 Sh	2 Ag
3 Sh	3 D	3 Ag	3 Sh
4 N	4 Sh	4 N	4 D
5 D	5 A-S	5 D	5 N
6 A-S	6 N	6 A-S	6 A-S

Both the head teachers and class teachers were asked to rank six types of problem behaviour in order of frequency of occurrence in school or class. It will be seen from Tables 4a and b that both heads and class teachers found problems of restlessness most common, though their rankings do not altogether agree, the head teachers putting more stress on shyness and nervousness than the teachers. Most of the head teachers stated that they found restlessness, aggressiveness and anti-social behaviour most difficult to cope with, and a similar response came from the teachers though the latter put "aggressiveness" at the top of their list. Three of the heads had excluded children for behaviour problems during the previous 5 yr, but some head teachers did not think that they would be allowed to exclude children for behaviour problems, and some were reluctant even to consider the possibility of such drastic action with infant children.

It is not surprising that aggressiveness and anti-social behaviour are picked out as difficult problems to cope with in school, but it is of interest to note the emphasis on restlessness, which is reported both to occur frequently and to be a difficult problem to tackle. Relatively little attention has been given in the past to symptoms of restlessness, although Cummings (1944, 1946), in her studies of behaviour problems and emotional symptoms in nursery and infant school children, underlined the need for more help to be given to restless children. She found restlessness expressed as "difficulty in concentration" particularly resistant to change, and suggested that the problems of restless children might well increase as school demands became more formal. Macfarlane *et al.* (1954) found, on the basis of mothers' reports, that overactivity, oversensitiveness, specific fears, tempers and excessive reserve were particularly characteristic of the behaviour problems shown by 5–6-yr-olds—these problems being shown by over one-third of the sample.

Area differences

The evidence on the relationship between socio-economic background and maladjustment in children is limited and somewhat confused, not surprisingly since a variety of factors may influence any study of this question, for example, the population studied (whether culturally homogeneous or heterogeneous), the method used to assess maladjustment, the age of the children and the criteria used for defining socio-economic level. In 1956 Sewell and Haller, reviewing the literature up to that time, concluded that there was a low but positive relationship between social status and measured personality adjustment and that the personality test performance of middle-class children was significantly higher than that of lower-class children. In their own study of 1462 children rather older than those in the present sample—10–14 yr—living in a Wisconsin community, a significant relationship was found between the social status of the family and the child's personality adjustment, but the size of the relationship was so small that it contributed relatively little to the explanation of the variance in measured personality in the group of school children investigated. Burchinal *et al.* (1958) using a random sample of 256 elementary school children in rural areas and small towns in four states in the U.S.A. found that data obtained from the Rogers Test of Personality Adjustment tended to support the hypothesis that children coming from higher socio-economic status families show fewer indications of personality maladjustment as compared with children from families of lower socio-economic status. In this country, Pringle *et al.* (1966) found a definite social class gradient in relation to Bristol Social Adjustment Guide score in the case of 7-yr-old boys, there being markedly more "unsettledness" and maladjustment among children whose fathers were in occupations falling into Social Classes 4 or 5 than in the higher occupational categories. In the case of the girls, however, although there was similar evidence of a decrease in "stable" behaviour through the occupational groups, the drop in incidence from one occupational group to another was not uniform. Making a survey of the prevalence of behaviour disturbance in junior school children in educational priority areas in Nottingham, Booth and Barnes (1969), using the Rutter Scale (1967), found an overall prevalence figure of 33·9% (38·3% boys; 29·4% girls) in three schools, situated in areas of the city characterized by poor housing and low occupational status, as compared with only 2·4% in a control school not in a deprived area. More anti-social than neurotic behaviour was found in both boys and girls.

Tables 5a–e give the analysis of the results of the present study in terms of area differences. The results for the deprived area and control groups (taken as a whole) are fairly similar in a number of respects on both the Stott pointers and the Schaefer rating, though there are significantly more aggressive children in the deprived area group (Table 5b). There are no significant differences between the deprived area and the settled working-class area children (Table 5c), but significantly more of the deprived area group show problems than the middle-class children (Table 5d). Although there are no significant differences between these two groups on items relating to specific types of behaviour disturbance, there is a tendency for the DA group to show more aggressiveness and unsociability. There are also significantly more of the settled working-class children showing problems than the middle-class group, though not strongly in any specific direction. Somewhat surprisingly, very little difference is found between the rural and urban children (Table 6) and it should be noted that one of the 11 rural schools accounted for over half of the adverse ratings given to the rural sample.

From Table 3, it will be seen that, largely in accord with these results, the head teachers of the deprived area schools considered that they were faced with considerably more behaviour problems than the heads of the control area and rural schools. They also considered that problems of restlessness and aggressiveness were the most common in their schools, while the heads of the CA schools placed nervousness and shyness at the top of the list.

Sex differences

It is well known that boys far outnumber girls as "problem pupils" at school (Jersild, 1968) and that this is the case even in the first year in the infant school is shown by the results of this enquiry.

Table 7a, which gives an analysis of the overall differences between the samples of 367 boys and 359 girls, shows that, both on the basis of the Stott pointers and the Schaefer ratings, the boys presented considerably more problems than the girls. The differences between the sexes were particularly marked in respects of restlessness, aggressiveness and not getting on well with others. Withdrawn behaviour, however,

TABLE 5a. AREA ANALYSIS

Area		No. of children	Numbers rated adversely on each Stott pointer						No. of Stott pointers scored				
			No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	0	1	2	3	4+
Deprived urban	*N*	355	41	34	39	29	24	38	259	49	12	14	21
	%		11·55	9·58	10·98	8·16	6·76	10·70	72·96	13·80	3·38	3·94	5·91
Settled working-class urban	*N*	169	19	21	13	6	12	22	124	16	13	13	3
	%		11·24	12·43	7·69	3·55	7·10	13·02	73·37	9·47	7·69	7·69	1·78
Middle-class urban	*N*	141	7	8	10	4	3	9	118	11	8	3	1
	%		4·96	5·67	7·09	2·84	2·13	6·38	83·69	7·80	5·67	2·13	0·71
Rural	*N*	61	7	5	3	3	3	7	50	3	2	4	2
	%		11·47	8·20	4·92	4·92	4·92	11·47	81·97	4·92	3·28	6·56	3·28

Schaefer adjustment ratings

Area		No. of children	1	2	3	4
Deprived urban	*N*	355	115	181	55	4
	%		32·39	50·98	15·49	1·13
Settled working-class urban	*N*	169	43	96	28	2
	%		25·44	56·80	16·57	1·18
Middle-class urban	*N*	141	71	61	8	1
	%		50·35	43·26	5·67	0·71
Rural	*N*	61	30	24	7	0
	%		49·18	39·34	11·47	0

TABLE 5b. χ^2 TESTS OF DIFFERENCES BETWEEN CA AND DA GROUPS—STOTT POINTERS AND SCHAEFER RATINGS (355 DA, 310 CA)

		Scoring adversely		Not scoring adversely			
Stott pointer	Group	*N*	%	*N*	%	χ^2	Probability
1 Normality of behaviour	DA	41	11·55	314	88·45		
	CA	26	8·40	284	91·60	1·49	N.S.
2 Withdrawal	DA	34	9·58	321	90·42		
	CA	29	9·34	281	90·66	0·001	N.S.
3 Restlessness	DA	39	10·98	316	89·02		
	CA	23	7·42	287	92·58	2·09	N.S.
4 Aggressiveness	DA	29	8·16	326	91·84		
	CA	10	3·23	300	96·77	6·46	< 2%
5 Relations with other children	DA	24	6·76	331	93·24		
	CA	15	4·84	295	95·16	0·79	N.S.
6 Stability	DA	38	10·70	317	89·30		
	CA	31	10·00	279	90·00	0·03	N.S.
		Scoring 1 + pointers		Scoring no pointers			
		N	%	*N*	%		
	DA	96	27·04	259	72·96		
	CA	68	21·94	242	78·06	2·06	N.S.
		Scoring 3 or 4 on Schaefer rating		Scoring 1 or 2 on Schaefer rating			
		N	%	*N*	%		
	DA	59	16·63	296	83·37		
	CA	39	12·58	271	87·42	1·84	N.S.

Note. In this and following tables "N.S." indicates that the value of χ^2 is below that needed to show significance at the 5% level.

TABLE 5C. χ^2 TESTS OF DIFFERENCES BETWEEN DA and SWC GROUPS—STOTT POINTERS AND SCHAEFER RATINGS (355 DA, 169 SWC)

		Scoring adversely		Not scoring adversely			
Stott pointer	Group	*N*	%	*N*	%	χ^2	Probability
1 Normality of behaviour	DA	41	11·55	314	88·45		
	SWC	19	11·24	150	88·76	0·002	N.S.
2 Withdrawal	DA	34	9·58	321	90·42		
	SWC	21	12·43	148	87·57	0·71	N.S.
3 Restlessness	DA	39	10·98	316	89·02		
	SWC	13	7·69	156	92·31	1·05	N.S.
4 Aggressiveness	DA	29	8·16	326	91·84		
	SWC	6	3·55	163	96·45	3·21	N.S.
5 Relations with other children	DA	24	6·76	331	93·24		
	SWC	12	7·10	157	92·90	0·002	N.S.
6 Stability	DA	38	10·70	317	89·30		
	SWC	22	13·02	147	86·98	0·40	N.S.
		Scoring 1 + pointers		Scoring no pointers			
		N	%	*N*	%		
	DA	96	27·04	259	72·96		
	SWC	45	26·63	124	73·37	0·00003	N.S.
		Scoring 3 or 4 on Schaefer rating		Scoring 1 or 2 on Schaefer rating			
		N	%	*N*	%		
	DA	59	16·63	296	83·37		
	SWC	30	17·75	139	82·25	0·04	N.S.

TABLE 5d. χ^2 DIFFERENCES BETWEEN DA AND MC GROUPS (355 DA, 141 MC)

		Scoring adversely		Not scoring adversely			
Stott pointer	Group	*N*	%	*N*	%	χ^2	Probability
1 Normality of behaviour	DA	41	11·55	314	88·45		
	MC	7	4·96	134	95·04	4·28	$< 5\%$
2 Withdrawal	DA	34	9·58	321	90·42		
	MC	8	5·67	133	94·33	1·5	N.S.
3 Restlessness	DA	39	10·98	316	89·02		
	MC	10	7·09	131	92·91	1·31	N.S.
4 Aggressiveness	DA	29	8·16	326	91·84		
	MC	4	2·84	137	97·16	3·80	N.S.
5 Relations with other children	DA	24	6·76	331	93·24		
	MC	3	2·13	138	97·87	3·36	N.S.
6 Stability	DA	38	10·70	317	89·30		
	MC	9	6·38	132	93·62	1·72	N.S.

	Scoring 1 + pointers		Scoring no pointers			
	N	%	*N*	%		
DA	96	27·04	259	72·96		
MC	23	16·31	118	83·69	5·80	$< 2\%$

	Scoring 3 or 4 on Schaefer ratings		Scoring 1 or 2 on Schaefer ratings			
	N	%	*N*	%		
DA	59	16·63	296	83·37		
MC	9	6·38	132	93·62	8·09	$< 0{\cdot}5\%$

TABLE 5e. χ^2 DIFFERENCES BETWEEN SWC AND MC (SWC 169, MC 141)

		Scoring adversely		Not scoring adversely			
Stott pointer	Group	*N*	%	*N*	%	χ^2	Probability
1 Normality of behaviour	SWC	19	11·24	150	88·76		
	MC	7	4·96	134	95·04	3·17	N.S.
2 Withdrawal	SWC	21	12·43	148	87·57		
	MC	8	5·67	133	94·33	3·38	N.S.
3 Restlessness	SWC	13	7·69	156	92·31		
	MC	10	7·09	131	92·91	0·0003	N.S.
4 Aggressiveness	SWC	6	3·55	163	96·45		
	MC	4	2·84	137	97·16	0·001	N.S.
5 Relations with children	SWC	12	7·10	157	92·90		
	MC	3	2·13	138	97·87	3·12	N.S.
6 Stability	SWC	22	13·02	147	86·98		
	MC	9	6·38	132	93·62	3·06	N.S.

	Scoring 1 + pointers		Scoring no pointers			
	N	%	*N*	%		
SWC	45	26·63	124	73·37		
MC	23	16·31	118	83·69	4·19	< 5%

	No. scoring 3 or 4 on Schaefer ratings		No. scoring 1 or 2 on Schaefer ratings			
	N	%	*N*	%		
SWC	30	17·75	139	82·25		
MC	9	6·38	132	93·62	8·03	< 0·5%

TABLE 6. *RURAL–URBAN DIFFERENCES (RURAL 61, URBAN DA 355, URBAN CA 310)

		Scoring adversely		Not scoring adversely			
Stott pointer	Area	*N*	%	*N*	%	χ^2	Probability
1 Normality of behaviour	Rural	7	11·47	54	88·53		
	Urban DA	41	11·55	314	88·45	0·04	N.S.
	Urban CA	26	8·40	284	91·60	0·28	N.S.
2 Withdrawal	Rural	5	8·20	56	91·80		
	Urban DA	34	9·58	321	90·42	0·01	N.S.
	Urban CA	29	9·34	281	90·66	0·002	N.S.
3 Restlessness	Rural	3	4·92	58	95·08		
	Urban DA	39	10·98	316	89·02	1·50	N.S.
	Urban CA	23	7·42	287	92·58	0·18	N.S.
4 Aggressiveness	Rural	3	4·92	58	95·08		
	Urban DA	29	8·16	326	91·84	0·38	N.S.
	Urban CA	10	3·23	300	96·77	0·08	N.S.
5 Relations with children	Rural	3	4·92	58	95·08		
	Urban DA	24	6·76	331	93·24	0·07	N.S.
	Urban CA	15	4·84	295	95·16	0·09	N.S.
6 Stability	Rural	7	11·47	54	88·53		
	Urban DA	38	10·70	317	89·30	0·002	N.S.
	Urban CA	31	10·0	279	90·00	0·01	N.S.
		No. scoring 1+ Stott pointers		No. scoring no Stott pointers			
		N	%	*N*	%		
	Rural	11	18·03	50	81·97		
	Urban DA	96	27·04	259	72·96	1·77	N.S.
	Urban CA	68	21·94	242	78·06	0.26	N.S.
		No. scoring 3 or 4 on Schaefer ratings		No. scoring 1 or 2 on Schaefer ratings			
	Rural	7	11·47	54	88·53		
	Urban DA	59	16·63	296	83·37	0·68	N.S.
	Urban CA	39	12·58	271	87·42	0·0007	N.S.

*Two separate values of χ^2 computed for each item; one Rural vs. urban DA; one Rural vs. urban CA.

TABLE 7a. SEX DIFFERENCES—OVERALL RESULTS (367 BOYS, 359 GIRLS)

		Scoring adversely		Not scoring adversely			
Stott pointer	Sex	*N*	%	*N*	%	χ^2	Probability
1 Normality of behaviour	Boys	45	12·26	322	87·74		
	Girls	29	8·08	330	91·92	3·03	N.S.
2 Withdrawal	Boys	35	9·54	332	90·46		
	Girls	33	9·19	326	90·81	0·001	N.S.
3 Restlessness	Boys	42	11.44	325	88·56		
	Girls	23	6·40	336	93.60	5·05	< 2·5%
4 Aggressiveness	Boys	30	8·17	337	91·83		
	Girls	12	3·34	347	96·66	6·91	< 1%
5 Relations with children	Boys	29	7·90	338	92·10		
	Girls	13	3·62	346	96·38	5·34	< 2·5%
6 Stability	Boys	43	11·72	324	88·28		
	Girls	33	9·19	326	90·81	0·98	N.S.
		No. scoring 1+ pointers		No. scoring no pointers			
		N	%	*N*	%		
	Boys	106	28·88	261	71·12		
	Girls	69	19·22	290	80·78	8·74	< 0·5%
		No. scoring 3 or 4 on Schaefer rating		No. scoring 1 or 2 on Schaefer rating			
	Boys	70	9·07	297	90·93		
	Girls	35	9·75	324	90·25	12·01	< 0·1%

is shown by boys and girls to the same extent. Pringle *et al.* (1966) also found a much higher incidence of behaviour deviance amongst boys than girls in the sample of 7-yr-olds, and present a picture similar to that of the present study in regard to types of behaviour disturbance shown.

Within the DA group (Table 7b), there is an overall significant difference between the sexes in respect to the incidence of behaviour problems, but when the responses to the Stott pointers are analysed separately, the boys show significantly more problems only with respect to aggressiveness. Within the CA group (Table 7c) the difference between the numbers of boys and girls scoring at least one adverse Stott pointer does not reach statistical significance, but there is a significant sex difference in respect to the restlessness pointer, and the Schaefer ratings, too, show such a difference.

Table 7b. Sex differences—DA group only (176 boys, 179 girls)

		Scoring adversely		Not scoring adversely			
Stott pointer	Sex	*N*	%	*N*	%	χ^2	Probability
1 Normality of behaviour	Boys	26	14·77	150	85·23	2·95	N.S.
	Girls	15	8·38	164	91·62		
2 Withdrawal	Boys	20	11·35	156	88·65	0·91	N.S.
	Girls	14	7·82	165	92·18		
3 Restlessness	Boys	21	11·93	155	88·07	0·16	N.S.
	Girls	18	10·05	161	89·95		
4 Aggressiveness	Boys	20	11·35	156	88·65	3·94	< 5%
	Girls	9	5·03	170	94·97		
5 Relations with children	Boys	16	9·09	150	90·91	2·80	N.S.
	Girls	8	4·47	171	95·53		
6 Stability	Boys	21	11·93	155	88·07	0·33	N.S.
	Girls	17	9·50	162	91·50		

	No. scoring 1+ pointers		No. scoring no pointers			
	N	%	*N*	%		
Boys	57	32·38	119	67·62	4·53	< 5%
Girls	39	21·79	140	78·21		

	No. scoring 3 or 4 on Schaefer ratings		No. scoring 1 or 2 on Schaefer ratings			
	N	%	*N*	%		
Boys	37	21·03	139	78·97	4·27	< 5%
Girls	22	12·29	157	87·71		

TABLES 7C. SEX DIFFERENCES—CA GROUP ONLY (160 BOYS, 150 GIRLS)

		Scoring adversely		Not scoring adversely			
Stott pointer	Sex	*N*	%	*N*	%	χ^2	Probability
1 Normality of behaviour	Boys	14	8·75	146	91·25		
	Girls	12	8·00	138	92·00	0·001	N.S.
2 Withdrawal	Boys	12	7·50	148	92·50		
	Girls	17	11·33	133	88·67	0·93	N.S.
3 Restlessness	Boys	18	11·25	142	88·75		
	Girls	5	3·33	145	96·67	5·96	< 2%
4 Aggressiveness	Boys	8	5·00	152	95·00		
	Girls	2	1·33	148	98·67	2·26	N.S.
5 Relations with children	Boys	11	6·87	149	93·13		
	Girls	4	2·67	146	97·33	2·13	N.S.
6 Stability	Boys	18	11·25	142	88·75		
	Girls	13	8·67	137	91·33	0·32	N.S.

	No. scoring 1+ pointers		No. scoring no pointers			
	N	%	*N*	%		
Boys	42	26·25	118	73·75		
Girls	26	17·33	124	82·67	3·09	N.S.

	No. scoring 3 or 4 on Schaefer ratings		No. scoring 1 or 2 on Schaefer ratings			
	N	%	*N*	%		
Boys	28	17·50	132	82·50		
Girls	11	7·33	139	92·67	6·38	< 2%

HANDLING THE PROBLEMS

The head teachers, when asked what help was available to them in dealing with behaviour problems amongst their pupils, mentioned the following professional personnel and agencies:

	Number of mentions	
	"Available"	"Not available"
Educational Psychologist	20	8
Medical officer of health	17	
Welfare officer	10	2
Child guidance clinic	7	3
Care committee	5	
School nurse/health visitor	8	
Child care officer	2	
School inspector	1	

The heads stated that they would like to have a better operation of existing services (3), aides in the classroom (3), remedial teachers (2), special classes (1), help from a social worker (2), someone with special responsibility for problem children (2), and a lower pupil/teacher ratio (1). However, as many as 13 head teachers (5 in deprived areas, 7 in control areas, and 1 rural head) were quite satisfied with the available services, and the interviewers gained the impression that not many of the schools made much use of outside services; the fact that a specific service was said to be "available" did not mean that it was called upon.

Sixteen out of the 48 class teachers, too, stated that they did not need any help in handling their problem pupils. Of the remainder, 12 replied that they consulted colleagues or contacted the parents when problems arose. Nine stated that they would call upon the educational psychologist when in difficulties, but in 5 cases this was seen as the very last resort. The only kinds of help mentioned as desirable but not freely available to the teachers were: advice on how to cope with problems in the classroom (2), an aide in the classroom (2), earlier assessment of ESN children (1), opportunities to take the children out of the classroom (1), a more formal classroom setting (1), better facilities for play (1), and more co-operation from parents (2).

The overall impression given by the responses of the teachers was that they would on the whole prefer to cope with children's behaviour problems by means of internal school resources, including aides and extra teachers, rather than by enlisting outside help. Some teachers saw the referral of individual children to agencies such as the Child Guidance Clinic as a step to be taken only rarely and in this connection it is interesting that there were suggestions from a few teachers that informal discussions of such problems with an outside specialist such as the educational psychologist would be valuable. Such discussion would presumably take place within the school setting normally but one head expressed the wish to join discussions (e.g. case conferences) among members of the various children's agencies when children from her school were involved. This desire for more effective communications between the school and such agencies was also evident among the teachers, who mentioned that the feedback of information to them about children referred to agencies such as the Child Guidance service was very often inadequate.

CONCLUSIONS

As a part of the studies of infant school children carried out by the Schools Council Research and Development Project in Compensatory Education, an enquiry was made into the nature and extent of behaviour problems amongst 726 children, aged 5 yr–5 yr 7 mths, attending 37 schools serving different types of catchment areas, rural as well as urban "deprived" and "control" (settled working class and middle class) areas. At the end of the children's second term in school, information was obtained from the head teachers and teachers of these schools, mainly by means of Stott's six adjustment pointers. As many as 24% of the total sample showed *some* indication of behaviour deviating from the desirable norm as seen by the teachers, and approximately 13–14% of the children appeared to be presenting problems to an extent warranting attention, though only a small proportion were thought to need specialist help.

There were no significant differences in the incidence of behaviour problems between the deprived area and the settled working-class area children, but significantly more of the deprived area group showed problems than did the middle-class sample. There was a tendency, not reaching statistical significance, for the deprived area group to show more aggressiveness and unsociability. Very little difference was found between the rural and urban children. The head teachers of the deprived area schools were particularly concerned with problems of restlessness and aggressiveness.

In the total sample, the boys presented considerably more problems than the girls, particularly in respect of restlessness and aggressiveness. Within the deprived area group, the boys showed significantly more problems only with respect to aggression, and within the control area group, only with respect to restlessness.

Over a third of the head teachers and teachers did not feel that they needed extra help or resources to deal with behaviour problems in their schools. Some of the others made various suggestions for additional resources, including aides in the classroom and a more efficient operation of existing services. The services of an educational psychologist were available to the majority (though by no means to all) of the schools, but on the whole the schools preferred to rely on their own internal resources for coping with behaviour difficulties in their pupils.

SUMMARY

This paper analyses information obtained from teachers relating to the incidence of behaviour problems in a sample of children in their first year in the infant school. Differences in the nature and extent of such problems are examined in terms of catchment area ("deprived"/"settled working class"/"middle class"; urban/rural) and sex. The views of the head teachers and teachers concerning the need for additional help or resources to deal with behaviour problems are discussed.

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APPENDIX

(The following questions form only a part of questionnaires used as a basis for interviewing the infant school head teachers and class teachers.)

Head teachers' questionnaire

1. What percentage of your infant children do you estimate present (i) *mild*, (ii) *serious* emotional, social or behavioural problems in school?
2. *Rank the following problem types in order of frequency of occurrence in school:
   aggressiveness to others
   shyness/withdrawal
   nervousness (tearfulness, timidity, etc.)
   restlessness/distractibility/poor concentration
   anti-social behaviour (lying, stealing, destruction of property)
   disruptiveness/unruly behaviour in class.
3. (a) *Which of the above problems do you find most difficulty in coping with?
   (b) Have you had to exclude any children for behaviour problems within the last five years?

(c) What help is available to you in dealing with these problems and to what extent do you call upon it?

(d) *What help not as present available would you like to have?

*Also completed by class teachers, with slight change of wording in 3(d)—"What help, if any, would you like in dealing with such problems?"

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SOCIALIZATION AND CONFORMITY

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INTRODUCTION

THE CENTRAL purpose of this article is to explore the relationship between socialization and conformity. Much of it will be theoretical, an analysis of the concept of socialization and its implications. However, although the approach is theoretical, it does have a bearing on the problems of the clinician. For example, the literature on socialization is largely based on the study of children and, within this, many contributions implicitly or explicitly deal with problems of socialization of the *disturbed child*. Disturbance does, of course, manifest itself in various ways: some children work out their problems on themselves, in anxiety and depression, others act them out in aggression or delinquency; and any one particular child may show a mixture of these "internal" and "external" symptoms (Anthony, 1970). Quite typically, however, the clinician is first called in because the child acts in a manner which is socially, and even legally, unacceptable: Susan, for instance, failed to attend school for eighteen months (Argles and Mackenzie, 1966); Arlene disrupted her class and Henry ran away from home (Graham and Meadows, 1967); Pam played truant, stole and misbehaved sexually (Skynner, 1969)—to cite only a few. Thus the initial presenting symptoms are often at best non-conforming, at worst positively anti-social behaviour. More significantly, progress and success of treatment are repeatedly assessed, at least partly, in terms of the child's increasing ability to "fit in" with his family, school or wider community. *In effect the clinician is often first faced with a child because that child is in some sense, "inadequately socialized", and feedback about the course of treatment is often based on criteria of socialization.*

Given that considerations of socialization constitute at least one important set of criteria of treatment, it becomes highly relevant to consider what is meant by "socialization". I do not propose to examine the multitude of definitions which have been offered by various authors at various times. Indeed that multitude of definitions is itself one of the problems which bedevils work in this area. To take two recent examples only

> "*For present purposes, we are using the term 'Socialization' to refer to child-directed maternal behaviour (and the behaviour of other agents), whether it is intended to train the child towards social norms or not.*" (Maccoby and Masters, 1970, p. 132).

and, in the same volume,

> "*In its usual sense, socialization is the acquisition of behaviour congruent with group norms and values.*" (Hess, 1970, p. 458).

This diversity of definitions stems from the attempt to define socialization by a finite set of behavioural phenomena, so that it may be said to be "child-directed maternal behaviour" or "the acquisition of behaviour congruent with norms"—and so on. Yet the enormous range and variety of behaviour which one individual may learn

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from his contact with others, makes it questionable whether socialization can in practice be defined by any such finite set of phenomena. Hence, instead of attempting to define socialization by what is learned, and how it is learned, it may be more fruitful to define it in terms of its function for the individual. Such a functional definition would also be more meaningful from a clinical standpoint. This can be seen most clearly by pursuing an argument recently put forward by Anthony (1970): symptoms of disturbance may well handicap the patient, but they also protect him in situations which would otherwise be intolerable to him; the only justification for removing such protective symptoms lies in the fact that they are "second best", and that mental health is better. If one accepts this logical (and ethical) argument, then the "socializing" elements and consequences of treatment have their rationale in their functional benefits for the mental health of the patient, rather than in the convenience of conformity to the community.

THE FUNCTION OF SOCIALIZATION

In its broadest and most widely accepted sense, the function of socialization is to enable the individual to "fit into", and form adequate relationships with other members of his group or culture. The crucial concept here is the notion of "adequacy". To describe a process as "adequate" involves a value-judgement, which implies that there are criteria on which such judgements may be based. The difficulty lies in formulating these criteria. An operational definition of "adequacy" quickly degenerates into being circular: socialization has been "adequate" if the individual "fits in", he "fits it" if and when socialization has been "adequate". This then leads to *ad hoc* criteria of socialization in terms of conformity. However, criteria of conformity also create two fundamental problems. First, conformity of the *overt behavioural* kind is a possible, but neither a necessary nor a sufficient criterion of socialization—just as behavioural non-conformity does not, by itself, betoken inadequate socialization. Secondly, to assess socialization in terms of overt conformity is to confuse the nature and function of the process with some, but only some, of its products: a child reared in a community of thieves may have undergone a perfectly "normal" course of socialization, in a psychological sense, without being acceptable and "fitting in" from a wider social standpoint; socialization, as a process, can be "adequate", without being "good".

It is therefore desirable to look for criteria of "adequate" socialization which are independent of behavioural conformity, even though in practice socialization and overt conformity may often go hand in hand. To do so we need to consider the function of socialization for man as a species (see Kelvin, 1970). In comparison with other species, very few of man's specific patterns of behaviour are determined genetically; genetic factors may affect basic psychological mechanisms and, to some extent, the individual's general capacity, emotionality and "temperament"; but the particular ways in which he behaves are a product of experience and learning. Related to this, the very fact that so little of man's behaviour is "built-in" allows him to manipulate and control his environment: he does not *have* to respond in set ways according to inherited patterns common to the species. But there are attendant problems to this relative genetic freedom: to enable learning from it, the environment has to be fairly stable, consistent or orderly; and to manipulate or control it, one must be able to make predictions; if the situation is constantly changing one cannot learn from it, nor use past experience as a guide to the future.

For the purpose of analysis it now becomes necessary to distinguish between the "physical" and the "social" environment, although in reality these two environments are interdependent and interact. The "physical" environment, in this context, consists of the environment considered in terms of the physical properties of objects, including man, and other living things, regarded as physical or biological entities. The "social" environment consists of people *qua* "people", and the things which, in a particular setting, gain their significance and function from their association with people—flags are socially significant pieces of coloured cloth. The fundamental difference between these two environments lies in the nature or basis of their relative stability or order. To illustrate this: I cannot walk through brick walls, I could commit incest; and even if one maintains that *some* form of incest taboo is common to the species, the precise forms which such taboos may take show considerable variations. More generally, order in the "physical" environment is a function of the physical properties of objects, and the "laws" which determine the relationships between them; any specific order in the "social" environment is essentially made by man, and can, in principle, be unmade or changed by him. Any one given individual is, of coure, born into and lives within a particular community, and the history, social structure or economic conditions of that community impose constraints upon him which for that individual have a quasi-physical necessity; but history may either be hallowed as tradition or rejected; social and economic structures may change. In other words, order in the "physical" environment is a "necessary" order, order in the "social" environment is a matter of "choice".

There is nothing mysterious about this, and we need not here become engulfed in controversy over "free will". The situation can be seen more simply. Because of the relative absence of a genetic programme man has a very rich behaviour repertoire; it is one of his physical or biological properties that the *possible* ways in which he might behave are, in principle, innumerable. Apart from basic biological actions, such as breathing, there are always alternatives; even so fundamental a "biological" activity as coitus can be performed in a variety of ways, and the cues for sexual arousal are highly variable and changeable—*vide* fashion. The availability of alternatives implies that the forms of behaviour actually adopted are a matter of choice, though a variety of factors, mainly social, will limit, constrain or condition the actual choices of a particular individual—which brings us back to socialization.

Social behaviour is, in essence, the behaviour of one individual towards others, their behaviour towards him. However, given that this behaviour can in principle take innumerable forms, it could, by the same token, be highly unpredictable; it is for example inherently unlikely that the action of any two, let alone more, individuals would be co-ordinated simply "by chance", that their actions would by chance "fit in" with one another. Social behaviour would then lack the consistency which is necessary for learning, and the social environment would lack the order which is necessary to allow any one individual to make at least rough predictions concerning the likely behaviour of others. Thus, to a species whose members have in a sense to manage their own affairs, rather than being genetically programmed, the social environment could easily become unmanageable. Seen from this very simple standpoint, the basic function of socialization is to make the individual reasonably predictable to the others who form his social environment—and to make these others reasonably predictable to him. It follows that the basic criterion for assessing socialization is whether or not, or to what extent, it has achieved this mutual predictability.

However, if one now asks *how* individuals become predictable to one another, the answer is, of course, that they do so in terms of norms: the norms of their general culture, the norms which define specific roles (e.g. sex roles, Hartley 1966; Mischel 1970) and the norms which develop between two or more people in lasting personal relationships (Thibaut and Kelley, 1959). Hence, if predictability depends on norms we would appear to be back to conformity. It thus becomes necessary to examine whether there is any gain in putting emphasis on predictability rather than on conformity.

CONFORMITY AND PREDICTABILITY

The fundamental difference between stressing predictability and stressing conformity, is that it makes conformity a means to an end rather than an end in itself. In doing so it focusses attention on the function of behaviour rather than on its characteristics—and "adequacy" of socialization would thus be assessed by the relevance of the behaviour to the situation, rather than by matching the behaviour against some putative standard of statistical norm. Such a functional approach has quite far-reaching implications.

The main weakness of "conformity" is that it denotes what can only be called a one-way phenomenon or process, namely the conformity of a given individual's behaviour to the expectations of others. Socialization, however, is obviously a two-way process: the child, for instance, may have to adapt itself to his family, but the family also has to adapt itself to the child. For example:

> "*Parents, however, are not immune to their children's behaviour. . . . Although one can exaggerate the influence of the child's aggression upon the parents' disciplinary practices, the possible contribution to the parent–child interaction has been largely ignored.*" (Feshbach, 1970, p. 228).

Identification of socialization with conformity, however, even if only tacit, has led to a pre-occupation with the conforming or non-conforming behaviour of the individual, at the expense of systematic study of the interactional process of which that conformity (or non-conformity) is itself the product. Yet the concept of an individual's "conformity" is quite meaningless except in relation to the expectations and behaviour of others. Furthermore, the conformity of any one person is indeed itself dependent on the conformity of others. Let *A* designate the individual becoming socialized and *B* the socializing agent, whether this be another individual or a group or society. The conformity of *A* to *B*, then, depends on the conformity of *B* to *A*. Thus *A* cannot conform to *B*, unless the behaviour of *B* is itself consistent, unless *B* has built up expectations about himself in his dealings with *A*, and generally meets these expectations. It is the conformity of *B* to *A* which enables *A* to predict *B*; and *A* cannot conform to *B* if *B* is unpredictable. Thus the process of socialization is one in which the individual being socialized and the socializing agents become predictable to one another. And this is, of course, what happens in practice. For example, often before he can fully understand, the small child is told not only what is expected of him, but also what he may expect of other people. In later life, at school or in work, interacting role-relationships are usually set out quite precisely—to help the new role-occupant fit into the group, to let him know where he stands in relation to others. Socialization in terms of role-relationships is based on *mutual* expectations among role-partners; and it is confounded by the failure of any one of the partners to meet these expectations.

The concept of "mutual predictability" thus brings into the open the essentially two-way or interactional character of socialization. Whereas the tendency to identify socialization with "conformity" tends to limit interest to *what* an individual does (to whether or not he conforms), "mutual predictability'. emphasises process and function, and offers clues to *why* he does it. For example, some of the serious consequences of an unsettled or disturbed childhood may in part be attributed to the difficulties caused by an unpredictable social environment. This is perhaps most obvious in studies such as those of Mischel (1961), in which young delinquents tended to choose a small immediate reward in preference to a larger but delayed one; these children often had a very unsettled early history, their social environment had been unpredictable; they therefore did not develop that confidence in the future which is necessary to tolerate delay. More fundamentally, childhood deprivation may, though it does not do so necessarily, lead to anxiety, insecurity and difficulty in forming personal relationships (e.g. Bowlby, 1952). It is often characteristic of "deprived" conditions that the adults surrounding the child, and on whom he depends, are changeable in their moods, or indifferent towards him, and they may indeed actually change, in institutions, or from foster-home to foster-home; and the child, of course, has to change with his situation. In such circumstances the child cannot locate himself within a stable social environment; he finds himself, as well as the grown-up world around him, unpredictable. Unpredictability may be a source of anxiety in itself, and it certainly interferes with the formation of personal relationships. The essence of a "relationship", as distinct from passing, superficial acquaintance, lies in its stability and continuity over time; it allows the partners to it to take one another for "granted"—which depends on being predictable to oneself, and on finding others predictable. It is precisely this mutual predictability which is often stultified by a deprived and unsettled childhood; the child, trying to cope with an unpredictable environment may, in self-defence, become locked in ego-centricity, using his own needs and demands as the only certain guide, becoming indifferent to the expectations of others and of society.

At a more theoretical level, the concept of mutual predictability allows for much more flexibility of behaviour than the concept of conformity, and in doing so can account much more readily for the phenomena of real life. Thus conformity is usually related to a particular context and the individual is said to be "socialized" when he fits into a particular group and conforms to the standards of behaviour expected of its members. Within limits this is indeed a useful *ad hoc* criterion of socialization, at a restricted, descriptive level. Fundamentally, however, it is quite unrealistic: it suggests that there comes a moment when the individual being socialized becomes socialized, and that the situation thereafter remains static. But the situation does *not* remain static, even within any one group. In a family the expectations held of a child, and which he holds of other members, change as he grows older; much the same happens at school and in jobs, partly as the individual assumes new roles and partly because any institution or job changes over time. In addition, of course, the individual changes the groups to which he belongs and the reference groups with which he identifies himself: from being a teenager he becomes a young man, middle-aged and elderly; he marries and becomes a parent; he moves house and finds new friends—and so on. Each change, whether gradual or abrupt, brings with it a new period of socialization, a modification of, or addition to, the norms and standards to which one conforms. Socialization is never completed: it is a continuing process, in which the individual continually revises his expectations, both of others and of himself. The essentially static concept of conformity does not allow for this continuous process of change, the concept of mutual predictability does: mutual predictability assumes that expectations are built up in the course of interaction, which in turn allows that expectations may be revised if there is some change in the pattern of interaction, or in the partners to it.

There is one further general point: for simplicity in exposition I have made much use of the concept of "interaction" which suggests personal contact between the individual and the socializing agents. This is an oversimplification. Socialization takes place not only during personal contact and at the level of overt behaviour, but also at a symbolic or more purely "cognitive" level, through the influence of, for instance, the mass media. This is particularly relevant in connection with "anticipatory socialization" (Merton, 1957), in which the individual adopts the standards (as he perceives them) of a group to which he aspires to belong but does not yet belong. Here, too, a criterion based on predictability allows for this more readily than a criterion based on conformity. "Conformity" suggests that there are "pressures", however gentle, to make the individual conform. But although it is fashionable to talk of the "pressures" exerted by the mass media, this is an essentially emotive and misleading analogy. There is a fundamental difference between the pressures which may be exerted by people with whom the individual interacts, and the "pressures" exerted by media of communication. In the case of interaction, the pressures exerted by others take the form of reinforcement and, in the extreme instance, may lead to attempts to force compliance. The mass media cannot force compliance; their influence depends on the individual's acceptance of the communication as valid for himself; any "pressure" is essentially self-imposed, as a result of that acceptance. What interaction and the mass media have in common is this: both provide information which creates expectations, and these expectations affect what the individual predicts about himself and the world around him. But there is a complication which is directly relevant to clinical practice and ethical considerations.

THE CONFORMITY PARADOX

Even the concept of mutual predictability is closely related to conformity; mutual predictability, in a sense, depends on mutual conformity, and all that has changed is that conformity, from being regarded as an end in itself, is seen as a means to an end. On this basis, the "socialized" individual would be one whose upbringing enables him to hold valid expectations of others, and to meet their expectations. In the ideal case, the fully socialized individual would always predict correctly what he should do in relation to others and what they would do to him; any departures from the ideal would be due to inadequacies in his or their socialization. This model is too simple. It makes non-conformity a purely negative phenomenon; it does not take account of another phenomenon, at least in advanced industrial societies, which is perhaps best called "the conformity paradox". The paradox is this: socialization, in the broadest sense, consists of learning the norms of one's society and coming to conform to them; however, one of these norms, and a very fundamental one, is the *norm of non-conformity*. I do not here refer simply to the occurrence of non-conformity, to non-conformity as a statistical fact, but to a norm of non-conformity in the psychological sense, such that non-conformity is expected and valued by ordinary, "respectable", members of society. To explore this we need to go beyond the confines of academic literature and consider also the evidence of our common knowledge and experience.

One of the basic assumptions and expectations of our society is that the individual will act as an individual, with individual responsibility for his actions—and not merely as a cog in the social machine. The importance of developing individuality is stressed for the rearing of children and in educational theories. We tend to disapprove of "systems" or institutions which produce a "type", and of individuals who simply behave as "types". Conversely, we disapprove of treating individuals as "types". More generally, although political systems may differ, most "advanced" societies lay much stress on respect for the individual, each claiming to offer him better opportunities for the realization of his individuality. Respect for individuality is thus a very pervasive value in human societies: it is indeed one of the most basic values which the child and adult is expected to accept, and his behaviour is expected to conform to it.

But, to a very large extent, *individuality* is itself assessed in terms of *non-conformity*. This is not merely common observation, reflected in the acceptance, however grudging, of adolescent "rebelliousness" as partly an assertion of individuality. There is some systematic evidence which goes further. Jones *et al.* (1961) have found that strict adherence to role-expectations provides little, if any, information about the role-occupant as a person: his role-partners assess personality by his individualistic departures from these formal expectations. Hollander's work and theory concerning leadership similarly emphasizes the importance of opportunities for *non-conformity* among emergent leaders (Hollander, 1964). His concept of "idiosyncrasy credit" postulates that an individual's initial conformity creates a balance of "credits", which then enable him, at times, to depart from the norms of the group without being rejected by its members; and the emergent leader is, of course, the individual whose departures from norms lead to innovations beneficial to the group.

To extend this more generally, a growing or dynamic group or society, as distinct from a static one, depends on creative individuals who innovate; perfect conformity is sterile, at best maintaining the *status quo*, at worst blocking adaptive change; change depends on innovation, i.e. non-conformity. Consequently, any society in which change is itself a norm cannot use conformity as its sole criterion of socialization. Furthermore, in advanced societies, "change" is not merely an ideological norm, a latter-day version of the Whig historian's notion of "progress". Change is inevitable in any scientifically developed society, since scientific and technological developments constantly alter the physical, economic and ecological conditions of life. Innovation at the intellectual or technological level therefore frequently demands modifications and innovation in behaviour generally, including innovation in and modifications of social behaviour.

Thus once we look at *what* we conform to, instead of talking loosely of "conformity" in general, we have to recognize the conformity paradox: one of the basic norms, expectations or assumptions of our society itself involves non-conformity; we value, foster and expect individuality, we value an individual who thinks and acts for himself, and we assess whether he does so by his *departure* from norms, rather than by his faithfully following them; and one of the basic reasons why we do so is that we depend on the non-conforming individual to introduce the innovations which both create new conditions and help us to adapt to them.

The concept of the "conformity paradox" is, of course, only the theoretical formulation, at a general level, of a dilemma frequently met in clinical situations. On the one hand "*deviation from these norms (of acceptable adult functioning) is regarded as illegal, immoral or neurotic*" (Hess, 1970, p. 458); on the other such deviations are sometimes an expression of individuality, or may protect the patient from otherwise intolerable psychological stress (Anthony, 1970). The conformity paradox thus pinpoints a problem which is central both to theories of socialization and to clinical practice: how can the individual become (or be made) socially acceptable without distorting his individuality?

BEHAVIOUR AND VALUES

Perhaps the first point to recognize, obvious but often ignored, is that although "socialization" is one word, it denotes two processes which operate at two quite different levels of psychological functioning: there is socialization in terms of *behaviour* and socialization in terms of *values*. "Behaviour" is here used in its strict sense, to denote overt, publicly observable actions. The concept of "values" refers to an internal process, the system of priorities or preferences, however acquired, by which an individual consciously or unconsciously selects between alternative courses of action (i.e. "values" may be regarded as intervening variables, inferred from behaviour, including self-descriptive statements and verbal expressions generally).

The difference between behaviour and values in this context can be best illustrated by comparing socialization during early childhood with socialization in maturity. The small child has to learn *how* to behave, before he can understand *why* he is asked to behave in a particular way. It is little use to explain to a two-year-old the value of life or the tenets of Christian love in the hope that he will then not run in front of a car or set fire to his brother's cot: one teaches him kerb-drill and stops him playing with matches. Thus, in general, the small child usually learns to act in a socially acceptable manner long before he can fully grasp the reasons and criteria for acceptability. This pattern may also occur in maturity, when an adult is forced to join an organization, such as the army, and has to obey its rules (e.g. Dornbusch, 1955). But in maturity there are also many groups and organizations which the adult joins because he wants to do so: he values the organization, what it stands for, and what it will do for him. After the event he may of course find that he has made a mistake, but the initial decision to join is based on the belief that the values of the organization coincide with his own. In the mature case, therefore, the individual has already accepted the organization's system of values, and his socialization in terms of behaviour merely fills in some practical details. Very broadly, then, the course of socialization in childhood is inevitably from behaviour to values; in maturity it is often, though not necessarily, from values to behaviour.

It follows that criteria of "adequate socialization" change as a function of the age of the individual. In particular, they shift from an emphasis on overt compliance in terms of behaviour during early childhood, to an increasing emphasis on acceptance of values in maturity. Indeed, in everyday life the main stress is on values: few would regard either the small child or the adult mental defective as fully socialized simply because he acts as a well-behaved automaton. And there is good reason for the importance attached to values: the system of values shared by a society allows its members to predict each other's behaviour, even if they do not know about one another's behaviour through personal contact. Once again it is useful here to contrast the situation of the small child with that of the adult. For the young child it is usually sufficient that he behaves in ways which are acceptable to his immediate family. As he matures, however, the number and diversity of his contacts increase: the rules of the game have to apply more generally. Furthermore, the increase in the number and variety of contacts *decreases* the relative amount of interaction which is possible with most of them; and the complications due to the greater size of the adult's social environment are aggravated by the fact that his repertoire of behaviour is much larger than the child's. The mature individual interacts with far too many people, mostly for far too short a time, to form more than few close friendships with norms and expectations of their own. Past experience of similarities of behaviour do, of course, generate numerous expectations and predictions at the purely behavioural level. But this is not enough, especially in a dynamic and changing society: the individual has to cope not only with new acquaintances, but also with novel situations. Assumptions about shared values, then, allow him to infer, if need be, the likely courses of actions of others, and the appropriate course of action for himself; they make it possible for him to predict behaviour in the absence of prior evidence from overt behaviour itself.

There remains the very basic question of how the individual acquires his system of values in the first instance. Fundamentally the answer is still very much a matter of conjecture, but there are two lines of thought which at least look helpful at the present time. The first may be derived fairly directly from Piaget (e.g. 1968). Many crucial values of society are labelled and expressed in an abstract conceptual form, by words such as "honesty", "generosity", "freedom" and so forth. Once the child has reached the developmental stage when he can begin to handle such concepts, he is in practice taught them quite explicitly. He not only learns the words, but also that they denote certain ways of acting, and that they provide criteria for choosing between alternative courses of action; he also learns that others approve of and share these values, and that he is expected to share them and act accordingly.

But these grand and abstract values are, of course, very general. There are also a host of much more mundane and specific values: one expects and appreciates a friendly greeting on passing a colleague in the corridor, one appreciates a pretty girl prettily dressed, one returns the drink a friend has bought in a pub. In effect, one values a host of little actions, whose function is simply to make everyday life more pleasurable but which have little, if any, deep moral significance. The second line of thought, which may account for these more mundane values, must still be treated as very tentative. It is derived from two independent sources: Bem's theory of attitudes (see Bem, 1968), and a theory concerning social norms which I have set out elsewhere (Kelvin, 1970). Bem's theory of attitudes may be simplified thus: an individual *infers* his own attitudes from exactly the same evidence that others would infer theirs. As a simple example, where others might say "John must like brown bread, he is always eating it", John, himself, if asked, might say "I suppose I must like brown bread, I'm always eating it". On this view, then, attitudes are inferred from behaviour or action, not least by the actor himself.

The problem of norms is somewhat more complicated. The general view has been that norms "prescribe" what "ought" or "ought not" be done, that they provide rules concerning what is "proper" and what is not (e.g. Brown, 1965). This leads to the assumption that certain forms of behaviour (consonant with norms) are frequent and probable because such behaviour is somehow prescribed and enforced. The probability of the behaviour is regarded as a product of prescription. However, in at least many if not most instances of everyday conformity, the direction of causality in fact goes the opposite way: the behaviour is *deemed* to be prescribed because, as a matter of fact and experience, it is indeed highly probable. For instance, a very frequent justification for conformity, or for the insistence on conformity, is that "we have always done this" or "everybody does this". The demand for conformity is thus frequently justified by the perceived probability of the behaviour in question.

If we now combine Bem's theory of attitudes with this view of norms, we are at least one step towards understanding the origin of many of the simpler values which affect everyday behaviour. The individual learns to behave in certain ways because these are the most probable ways of behaving in his group or society. He perceives himself as acting in these ways and, on Bem's theory, this itself will lead him to suppose that this is how he likes to act.

Values, then, have their origin at two levels. The highest and most general values, such as "honesty", are transmitted, inculcated and accepted at an essentially conceptual level. The more mundane values of day-to-day concourse have their basis in the probability of the behaviour in question; and the value attached to such behaviour is a product of its perceived likelihood. (Note that the probability of certain actions may make them valued and liked even though they are not necessarily "approved" by criteria of morality.)

This distinction between two levels of socialization is not merely a conceptual refinement or nicety. It is related to two very different psychological processes which we have already encountered in passing, compliance and acceptance. Thus overt *behaviour*, can to some extent be enforced or controlled: the individual can be made to comply with the behavioural expectations of others, inasmuch as these others can reward conformity or punish deviation. But he cannot be forced to share the *values* of others. Values are accepted or rejected, they are not a matter of compliance. In one sense, compliance is imitative, the individual copying the actions which he is told are expected of him: acceptance rests on identification, the individual having adopted other people's values as his own. However, our analysis of the origin of mundane values also suggests that compliance with everyday behaviour will tend to lead to acceptance. To this extent, therefore, there may often be much gain in attacking certain presenting symptoms by "behaviour therapy" in its widest sense. For example, getting the truant into school may itself help to get him to like school: conversely, truancy demands attention at its earliest manifestation, rather than a policy of "wait and see" whether it is symptomatic of deeper disturbance. But although compliance may thus itself lead to acceptance, through a change in self-perception, there remains the difficulty of the conformity paradox and, with it, the apparent dilemma of making the individual socially acceptable yet without distorting his individuality.

THE CONFORMITY PARADOX: A PARTIAL RESOLUTION

In the first place it is perhaps important to recognize that there is nothing new about the ethical problems of socialization: they are essentially the historic problems of the balance, and conflict, between the needs and rights of the individual and those of his community--and these issues have engaged moral and political philosophers from time immemorial. There is nothing unique about the dilemma of the clinician. But to some extent the dilemma is itself a false one. It is based on an artificial and exaggerated separation of the individual from his community. In its extreme form it assumes that the individual is born with innumerable propensities which would all find expression if they were not constrained or stultified by society. The inhibiting role which is attributed to society here is reminiscent of the early Platonic notion of the soul as imprisoned and distorted by the body. It ignores not only that the individual is inevitably a member of a community (as Aristotle recognized soul to be part of the body) but that the "individuality" which we cherish is itself expressed *within* the framework of society. Thus the problem of socialization becomes the problem of achieving individuality within a social setting. The distinction which I drew earlier between conformity in terms of behaviour and in terms of values does not wholly solve this problem, but at least it helps to clarify the issues. The relation between values and behaviour is essentially that of the general to the particular. Values, however acquired, operate as general principles which may be expressed in numerous different forms of specific behaviour. The values which are shared by members of a group or community thus allow for flexibility at the level of behaviour against a background of continuity, stability and, therefore, predictability in the criteria of choice between alternative courses of action. Socialization in terms of values therefore enables the individual to "fit in" with the basic assumptions of his group or culture, yet still allows him to retain his individuality within it; it allows him to *behave* as an individual who makes his own interpretation of, and gives his own expressions to common values. Hence, if the presenting symptoms of disturbance suggest inadequate socialization, more acceptable behaviour does not itself betoken adequate socialization. Socialization does not consist of compliance with stereotyped patterns of behaviour; it consists of acceptance of values which may indeed be expressed in divers ways. The pressures of clinical practice may often only afford opportunity to deal with behaviour—and as I argued earlier "behaviour therapy" may indeed often work. Ultimately, however, behavioural conformity can only be regarded as a possible first step towards socialization in terms of values.

SUMMARY

The presenting symptoms of disturbance often take the form of "non-conforming" behaviour, suggesting "inadequate socialization"; conversely, the course of treatment is often evaluated by criteria of conformity and adequate socialization. The clinical situation thus touches on issues considered by social psychologists as well as by clinicians themselves. This article presents a social-psychological analysis of socialization. It examines the psychological function of socialization and the limitation of conformity as a criterion of socialization. By implication it suggests that behavioural conformity does not provide adequate criteria either for socialization or for the evaluation of treatment.

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CRITICAL NOTICE

Manuel de Psychiatrie de l'Enfant. J. DE-AJURIAGUERRA. Masson, Paris, 1970, 1023 pp.

THE BOOK is divided into four main parts. The first deals with general problems, the second with various functions and their disorders, the third describes the major syndromes and the fourth views the child within the different social settings to which he belongs.

General problems

From the beginning of the first part, one is able to perceive what makes this textbook unique. It is always vivid, subtle and provides a remarkably integrated combination of the contribution of the different schools by one of the major leaders in the field of contemporary psychiatry.

The work of the great pioneers, Piaget, Wallon, Freud, Spitz and Melanie Klein are presented with clarity and faithfulness and to this already wide panorama, Ajuriaguerra adds his own personal contribution concerning the maturation of underlying structures. Then comes a very original chapter dealing with the psychobiological disorganizations in the child. Ajuriaguerra faces the very difficult problem of delineating the normal from the pathological and applies his viewpoint to the field of childhood through adding the essential concept of levels of evolution. Dealing with disorganizations, he warns the reader against unidimensional approaches; he opposes the lesional disorganizations and the functional ones and delineates the meaning of the concept of immaturity.

The functions and their disorders

The second part deals in succession with the physiology and the pathology of sleep, feeding, psychomotor organization, language, apprehension and knowledge of the body, sexuality and aggressive drives.

Chapter VIII, dealing with psychomotor organization, bears the mark of one of the main scientific allegiances of Ajuriaguerra who worked for years with the great Andre Thomas. At this point it would appear to the present writer that the classical typologies might have deserved a more critical approach but at the same time the French reader who feels free of the traditional concepts of French psychiatry, at least, will be delighted to read a formal condemnation of the classical French concept of motor deficiency (*debilité motrice*), devised by Dupre and which tended to establish a close parallel between mental deficiency and motor immaturity or clumsiness.

Ajuriaguerra's own contribution extends to the study of involuntary combined movements (*syncinesies*) whose evolution in the normal child he has carefully studied with his associate Myra Stambak. He might as well have presented the reader with the techniques of examination of lateral dominance, another field very familiar to him. There has always been in the mind of the present writer a very strong question mark about the validity of the concept of right and left eyedness, as the movements of both eyes are conjugated and the visual fields are crossed. The following chapter dealing with sphincter training might also have taken into consideration constipation, this mythical disease almost completely built up in children by obsessional mothers.

The chapter on language is first class. Here again Ajuriaguerra has done extensive personal work in this field, mainly with Madame Borel-Maisonny who is probably the leading expert in this discipline in France. And maybe there is something in the air in Geneva which reminds one of the pioneer work of de Saussure? Another chapter, just as original and stimulating, is the one dealing with the apprehension and knowledge of the body. Ajuriaguerra has had a very long and deep training in neurology and then underwent a personal psychoanalysis. This chapter tries to build the bridge between these two apparently incompatible disciplines. The chapter on sexuality is equally diversified and enriching.

I have been very interested in the study of aggressiveness. Usually this is dealt with in a rather low-level descriptive way, a kind of matter-of-fact sad report of facts. Ajuriaguerra brings together his knowledge of neurophysiology and data pertaining to ethology. Finally he uses the classical though disputed Freudian concept of the death instinct which has been so largely used by Melanie Klein. He also refers to the classical work by Margaret Mead and to the comparisons she established between the gentle Arapeches and the fierce Mundugumors. After this stimulating trip to foreign lands he comes back to a more clinical approach and deals with the major issue of suicide and the concept of death in the child. Once again he is far above the usual level of the average textbooks in child psychiatry which combine nice feelings with poor descriptions. Here the reader will find a masterly outlook of the drama of human existence which starts with the first cry and ends only with the last gasp. There has been so much tendency to a kind of conceited microsociological approach in the recent literature that we can only express our approval of the way he deals with this major problem.

The major syndromes

The main organically determined conditions are studied and described with a sufficient wealth of bibliographical references and, again contrary to the usual textbook of psychiatry, the most recent advances such as the chromosomal aberrations or the various types of metabolic inborn errors are mentioned. The chapter dealing with what Ajuriaguerra calls neurotic and psychotic organizations is just as well documented and eclectic. The bibliography is not restricted to one linguistic area and while the works of the leading French-speaking writers, such as Lebovici or Diatkine are reviewed, the same applies to the American, the British and even the Soviet psychiatrists. There is no attempt to force upon the child the classical though debatable nosological entities drawn from adult psychiatry; for instance the validity of the concept of manic depressive disorder in childhood is very carefully discussed.

Psychosomatic medicine in childhood is then reviewed in an open-minded way but he carefully avoids the usual broad statements and truisms such as—"the child is a whole" and so on.

The child and his social milieus

The final chapter is devoted to a sociological approach, both micro- and macrosociological. Here again the reader will find a wealth of bibliographical references which is not very common in the French medical literature. The same remark applies to the very useful index.

This textbook on child psychiatry appears to be on a higher level than all those published previously, including the English and American ones. It would probably not benefit an un-trained reader and here lies the only critical remark that might be made: this is not a clinical textbook, at least as far as case histories are concerned. The originality of psychiatry as compared to the rest of medicine lies probably in the fact that personality plays a very important part even when a well-defined pathological process can be described. It is not an easy book to read but every time the reader is referred to the right reference and is invited to broaden his knowledge.

For all these reasons and an additional one, namely that the vast majority of English speaking child psychiatrists are not familiar with the European literature, it would be invaluable in the opinion of the present reviewer to have this book translated into English.

CYRILLE KOUPERNIK

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BOOK REVIEWS

Hospitals, Children and their Families. The Report of a Pilot Study. M. STACEY, R. DEARDEN, R. PILL and D. ROBINSON. Routledge & Kegan Paul, London, 1970, pp. xii + 188. £2.50.

THE PLATT Report on the Welfare of Children in Hospital, published in 1959, was a humane document based on familiar findings of research and observation concerning the disturbing effect that hospital admission can have on young children, especially the consequences of traumatic separation from the mother at a critical time. It has resulted in great improvements in many children's hospitals and wards; yet there are still many others which have failed to implement its recommendations, despite urging by central and regional health authorities. Why should this be so? A team of three sociologists and one child psychiatrist at University College, Swansea, who set out to investigate the reasons and to re-examine the whole question of the hospitalization of children, here present their findings. Although the study is on a small scale, it deserves the attention of everyone concerned, whether professionally, administratively or personally.

The short answer that emerges to the question posed above is that the Platt Committee concentrated on the mother/sick child dyad to the point of virtually ignoring the social context, including the needs of nurses, of families at home and even of the mothers themselves. Thus, after listing the arguments adduced against unrestricted visiting, the Report merely states the conviction "that where the practice has been adopted . . . all the difficulties mentioned have yielded to simple adjustments . . ." without showing any sign of awareness of the difficulties faced, either by nursing staff in preserving their professional image in the face of day-long scrutiny by outsiders (or in finding an acceptable alternative image), or of the mothers in defining a new role *vis-à-vis* those in authority who, as a majority of parents have always assumed, know best what must be done for the sick child. Miss Pill's chapter in the present book is a most lucid and revealing account of these difficulties on both sides, and shows how they can lead to an effective reduction of visiting time even in the face of its official extension.

The Report also paid scant attention to the problems faced by mothers in making arrangements for other children left at home while they spent most of their time with the child in hospital, and further assumed that they would uncritically accept this child's need of their presence as a top priority. The difficulties of catering for other pre-school children in an isolated nuclear family are real enough, and lead the authors of this book to suggest a hospital crêche for visiting siblings. As regards mothers' attitudes, there is much evidence of conflicting obligations, a feeling of being in the nurses' way and a lack of any clear rational basis for judging the individual child's need of his mother's presence. An interesting glimpse of the irrational: those mothers who admitted to most fear of hospitals themselves, far from being the readiest to support their children through the experience, tended to avoid more visiting than strictly necessary! The need for more information for parents, better communication with doctors and senior nursing personnel, help in preparing the child for admission, involvement of the mother in the settling-in process, and the provision of facilities for organized play —all mentioned by Platt—is re-emphasized in the light of evidence on the extent to which these amenities are still lacking. In addition, a demand is made for new conceptualization in the training of nurses to enable them to include the parents as partners in the total care of the child: without this, the spirit of the reforms will continue to be stultified.

The work reported here falls into two parts. There is an interview-based survey of the attitudes of a sample of parents who had had young children in hospital, of another sample who had not, and of a third who had experienced the living-in arrangements at Amersham General Hospital. This interesting survey by David Robinson was undertaken at the suggestion of the Ministry of Health when it provided funds for the research originally planned, to which the larger portion of the book is devoted. This research, rather misleadingly termed a "Case Study" since no individual cases are described, is a detailed study of 32 4-year-old children admitted for tonsillectomy to two South Wales hospitals. It included an interview with the parents prior to admission, observation of the child on the ward and of the interactions between him and the adults concerned in his care, and home visits by the psychiatrist once before and three times after the hospitalization. One of the chief purposes was to try to establish criteria for the identification of children specially vulnerable to separation from their mothers. The psychiatrist found that four-fifths of the children showed some deterioration of adjustment immediately after the hospital experience, but that within 6 months about one-half had regained their pre-hospital adjustment ratings. Of those who had not, 7 had already been diagnosed as "maladjusted" prior to admission, but 10 who had previously been rated as adequately adjusted still showed, after 6 months, some continuing disturbance dating from their time in hospital. By comparing her observations on children and mothers of these two groups with those who recovered normally, the psychiatrist, Rosemary Dearden, derives a number of provisional pointers to vulnerability. The sociologist, Roisin Pill, who observed children in the ward, noted 9 whose behaviour with their parents was atypical—either apathetic or abnormally distressed—some of whom were in the "disturbed" group and others not. Margaret Stacey, the Director of the project, in drawing together these findings, compares 13 children assessed as normal by both workers with 19 who were found to be atypical by either or both. Her list of discriminating factors differs from those of Dearden and Pill in wording and emphasis and also in the omission of certain points which she discusses elsewhere. So many different versions of the conclusions are confusing and must engender doubt as to the confidence placed in them by the researchers themselves, based as they are on so few cases.

Yet some of the findings are surprising, potentially of great importance and certainly worthy of fuller investigation. To pick out three: children who recovered normally were more likely to come from a nuclear family than from an extended household, to have more prior experience of non-traumatic separation, and to have mothers who professed authoritarian rather than permissive child-rearing practices. It is in pondering the meaning of such conclusions that one feels the need of more information, especially of the qualitative kind that only case histories can give.

The book is full of interest, if somewhat indigestible in places. The attempt to assess vulnerability is a most welcome first step in an undertaking which will require much larger scale experimentation over a considerable period. The direction of attention to the sociological problems within the hospital, the nature of the readjustments called for on the part of child, mother and hospital staff, and the causes of continuing difficulties could be sufficient in itself to prompt a number of experimental modifications which might even reveal ways of converting hospitalization from a trauma into a salutary experience for growth. It is to be hoped that the authors will produce a version for the general reader, in which all statistics are relegated to an appendix and the text illumined by far more live material, such as quotations from interviews and descriptions of the children in their cots and during the home visits and doll play sessions. Few administrators, doctors, nurses or parents will wade through this scientifically presented material with the close attention it deserves, and they are the only people who can effect the transformations required.

TERENCE MOORE

Infantile Autism. A Clinical and Phenomenological-Anthropological Investigation Taking Language as the Guide. GERHARD BOSCH. (Translated by DEREK and INGE JORDON.) Springer-Verlag, Berlin, 1970, pp. xi + 158. $10.50.

WITH THIS translation of his 1962 German monograph, Professor Bosch has added an appendix in which he summarizes his own findings and conclusions on infantile autism and relates them to the English-speaking literature. This constitutes a succinct, thoughtful and critical survey of the present state of clinical knowledge (experimental studies are not considered). Genetic factors in aetiology are regarded as so far non-proven, cerebral-organic factors as frequent and certainly significant, and psychogenic factors as only extremely rarely directly responsible for the development of autism. In his own series of cases Professor Bosch found only a minority of cold affectionless parents but he did confirm earlier findings on their upper occupational level. A normal I.Q. and speech at 5 years were found to be good indicators of a better prognosis, as noted by other workers, and his figure of 7/33 for a favourable outcome is in keeping with most other investigations. Milieu and orthopedagogic therapy aimed at developing the child's understanding of social situations is described as the basis of treatment, with drugs playing an important ancillary role. He considers that the primary defect in autism is an impaired perception and comprehension of pre-linguistic social signals and this is thought to underlie the language retardation.

Although this part of the book adds little that is new it provides a useful summary of views in lucid and easily followed language. For this reason there is much to be said for starting the book at the back, in order to avoid the misunderstanding that Professor Bosch reports as a problem in some people's reading of the original German text. This approach also avoids the 40 pages of case-histories which make the beginning a bit heavy and repetitive. Nevertheless, the meat and the novelty lie in the author's philosophical (he calls it phenomenological–anthropological) discussion of the nature of personal experience, the "me" and the "not-me", in the context of the autistic child's language disorder. Autism is seen as a specific modification of human existence but one which fundamentally differs from Bleuler's concept in that autistic children have no "autistic" world of imagination. The fault lies in a failure of development rather than any withdrawal from reality.

The pre-verbal behaviour of looking, vocalizing and gesturing is impaired in autistic children and later there is a predominance of imitation and representation in speech (he does not comment on the accompanying *lack* of imitation and representation in play and drawing). The first appearance of the use of the personal pronoun "I" in normal children is regarded as a clearly distinguished stage in the separation of the child's own actions from the actions of others and hence is linked to the concept of "having". In autistic children the delayed appearance of "I" is associated with a failure to differentiate speaking, asking, and demanding speech from listening, answering and demand-following speech. There is a lack of calling, indicating and responding language, and questions tend to be stereotyped and repetitive. The autistic child fails to differentiate the animate and inanimate and even when speech develops social communication is lacking. These linguistic features are discussed in terms of the meaning of "I" in the grammar of different languages and the language abnormalities are linked to a postulated basic underlying defect in the appreciation of social signals.

Professor Bosch's consideration of social signals in terms of "personal identity" departs from current theories of autism which place the defect in the area of cognition and language. However, his observations are similar to those of others and a careful reading of his argument shows that the differences lie more in the realm of semantics and emphasis than anything more fundamental. His existential approach to phenomenology may not advance the scientific study of autism but it is of value in provoking thought on possible connections between linguistic development and the growth of social relationships.

MICHAEL RUTTER

Psychological Experiments with Autistic Children. B. HERMELIN and N. O'CONNOR. Pergamon Press, Oxford, 1970, pp. vi + 142. $8.00.

IT IS REFRESHING to read this useful account of the experimental studies of infantile autism carried out by the M.R.C. team over the last eight years. In recent times we have been assailed by a plethora of simple theories of autism. Autistic children, we are told, are deficient in experience of parental warmth, ability to express rage, self-recognition, and intellect, and subject to lack of intellect, over-arousal, under-arousal, and many other constructs. Each concept all too often exemplifies an absence of clear thinking, and apparent ignorance of the scientific disciplines relevant to the particular authors' work. Against such a background of dogmatic assertion, the authors of this book have got on steadily with a sensible series of experiments which for once provide us with real data about these complex children.

Separate chapters are devoted to a review of previous studies, and series of experiments on perception, language and recall, and responsiveness and arousal. A final chapter draws together the findings presented in the previous sections.

As is usually the case with reality, the conclusions are too complex to be easily summarized here. However, the whole series of studies forms a cogent experimental account of autism which may be very usefully set beside the generally accepted clinical picture of the disorder. The findings indicate a basic incapacity to appreciate order or pattern where this involves extracting the structure of a sequence of stimuli, together with a tendency to impose simple, repetitive patterns on all input, whether random or not. These faults seem to be widespread but most marked in auditory-vocal channels.

The authors consider the overlap of autism and mental subnormality and the related problem of separation of autistic symptoms into those indicative of developmental delay, and those which represent abnormal deviance. Several findings confirm the crucial relevance of non-verbal I.Q. that has been found in most other studies in which the workers concerned bothered to include the variable. In Hermelin and O'Connor's series, autistic children with higher I.Q. tended to display more subnormal or developmentally earlier cognition, and less of an abnormal kind.

Perhaps the most caution should be attached to their findings in respect of social responsiveness, since their measurement of it was carried out in very simple and restricted situations. The authors themselves state this clearly and concede that the conditions did not tax their subjects socially to the degree that natural situations would.

The material is well presented although there are signs that it was too hastily edited. One or two statements appear to conflict and may confuse the reader. For example, the authors affirm (p. 65) that "in our view, it would be mistaken to assume a single basic primary handicap such as the linguistic one. The autistic child . . . suffers from multiple handicaps affecting many, and in severe cases, most channels of input and output". However, a later statement (p. 129) suggests that a single central deficit may be present involving the above-mentioned imposition of stimulus independent patterns on the environment. The book's final sentence appears to contradict further by suggesting that "we regard the inability of autistic children to encode stimuli meaningfully as their basic cognitive deficit". Such apparently conflicting generalizations detract from the otherwise high quality of the book but presumably will be modified in later editions.

This book should be a readable but suitably detailed source for research workers who want to continue the good work reported within. It should also be very useful for teachers and clinicians who want a factual base upon which to build remedial methods with any chance of future success.

LAWRENCE BARTAK

Tredgold's Mental Retardation. ROGER TREDGOLD and KENNETH SODDY. 11th Edn. Baillière, Tindall & Cassell, London, 1970, pp. xi + 490. £5.00.

THE ELEVENTH edition of this well-known textbook illustrates the difficulties which beset those who would revise a classic. The reverent desire to retain the style and views of the original author is inevitably in conflict with the need to introduce, ruthlessly, modern idiom and thought. This dilemma, and the problem of covering a wide and increasingly complex field by the use of several contributors from different backgrounds, has led in this case to a peculiarly disjointed treatment unusual in a textbook.

Biological aspects of aetiology receive little general or theoretical discussion on the one hand, and three chapters of synoptic description of syndromes on the other. This results in a complete absence of information on dermatoglyphics, one page on cytogenetics, and four pages of standard clinical description of Down's Syndrome. In the latter there is no mention of the important early sign of hypotonia, or of the radiological pelvic signs. Neuropathology is briefly introduced with six plates, and dismissed with several paragraphs of text.

By comparison with these organic tinkerings, sound as far as they go, less restraint is shown in some of the psychiatric chapters. In particular, the 69 pages on disorders of relationship formation are padded out with 13 case-histories, a preoccupation with clinical anecdote which gives the reader little help, apart from a substitute for the experience better gained in clinical practice. The discussion of the aetiology of autism wisely considers it premature to form firm conclusions regarding the contribution of organic and psychological factors. Nevertheless the author's interpretation of his case-material indicates a strong leaning towards a psychopathological explanation: "In our sample of cases it was not so much separation from the mother as some more subtle deficiency in maternal nurture that was significant". Most eclectic clinicians and cautious scientists would ascribe only a minor modificatory influence to parental behaviour.

Although the chapter on retardation of mental development pays proper attention to the work of Earl, no mention is made of Piaget, O'Connor or Luria. In fact most of the material on the personality of the mentally handicapped has an archaic, historical flavour, and seems to indicate, with its unquestioning reliance on older clinical descriptions, an unawareness of the influence of educational and social opportunities.

The chapter on family counselling gives useful guidance, based on the pioneering work of André Repond in Switzerland, and the experience of two of the authors who have run a counselling service in London since 1952. Other topics covered in the book include the concept of mental deficiency, prevalence, examination and diagnosis, legal aspects, treatment and training.

Looking at the book as a whole one is struck by the uneven style, the extreme disparity of space allocated to different topics, and the absence of mention of modern treatments (operant conditioning) or current issues (residential care, normalization). It is refreshing to find a textbook on mental deficiency which concentrates on a clinical psychiatric approach, for which there is an important and growing need. This attempt to fill the gap would have been improved by a radical up-dating of material and style, a better balance between topics, and a closer relationship between factual detail, illustrative case-studies, and a conceptual frame-work.

There is no doubt that *Tredgold* still occupies a unique historical position in the range of textbooks on the subject, but whilst it is of interest to the expert, it can hardly be said to meet the needs of the student in search of a lucid, balanced coverage of contemporary clinical practice.

JACK BAVIN

Language and Teaching: A Psychological View. PETER HERRIOT. Methuen, London; Barnes & Noble, New York, 1971, pp. 109. £1.25 (University paperback 60p).

THIS IS a short, non-technical book, comprising ten easily-read chapters. Intended largely for student teachers, it is of practical rather than theoretical interest and must be judged accordingly.

Without reference to any psychological theories or their authors, Dr. Herriot has used both theory and the results of psychological research, as well as some personal speculation, to discuss relatively informally the role of language in the overall development and education of the child. Throughout the book he points to the implications of research findings for the teacher and makes suggestions for their practical implementation in the classroom. Thus the book is intended to be a "stimulus of ideas" concerning "the aims and methods of teaching", rather than a factual account of relevant psychological theory. In the first three chapters, the author briefly describes and defines the nature of the communication process, the psychological approach to the study of language and the developmental interaction of language and thinking, and the skills involved in language behaviour—both linguistic and non-linguistic. There then follows a rather partisan, by the author's own admission, developmentalist account of the acquisition of linguistic skills by the child. This first part of the book is therefore principally concerned with a definition of processes and a simplified version of some relevant linguistic theory.

The remainder of the book is of more practical interest. The author now relates his ideas much more directly to the classroom situation and, in discussing in turn the problem of language deficit and remediation, the importance of language in the cognitive, personal and social development of the child, and day-to-day language behaviour in the classroom (including sections on reading and writing), he makes many valuable and practical suggestions to the teacher as well as some rather idealistic ones, based on the results of psychological theory and research. His suggestions for helping children with a language deficit are sensible and grounded in learning theory; his admonition to teachers not to assume that advanced language ability in a young child implies a similar level of logical thinking ability, and that the teacher's language must not be too far in advance of the child's level of language *and* thinking, is well made. However the practising teacher may smile at the impracticality of some of the ideas expressed. For example, on the ground that before language has been internalized, children require to talk to regulate their behaviour, the author pleads for the child to be allowed the maximum of verbal expression; also, he emphasizes the importance of providing the child with immediate feedback on his behaviour as the best way to modify that behaviour. While not in any way questioning the validity of these suggestions, there is a limit to the stamina of a teacher faced with a class of thirty children. Indeed, some of the points raised might more effectively be directed at parents rather than at teachers in present-day classroom conditions.

Many other questions are raised and discussed, including several open-ended ones on the role of the teacher in the moral and social development of the child, and the use and abuse of influence.

Overall the author has presented some interesting ideas on the application of psychological knowledge in the classroom, and done so in a pleasantly uncomplicated style. One hopes his readers will cause the ideas to develop and multiply.

DAVID A. WARDEN

The Appraisal of Intelligence. A. W. HEIM. National Foundation for Educational Research in England and Wales, London, 1970, pp. ix + 169. £1.25.

THIS IS a reissue of Dr. Heim's book on the appraisal of intelligence first published in 1954. Apart from some footnotes, a preface, and a list of recent books for "further reading", the book appears unaltered. Its publication is justified partly on the grounds that the majority of criticisms which were applied to the then current methods of measuring intelligence are still pertinent. While there have been major advances in psychometrics since the 1950s, these have not yet extensively penetrated applied psychology. Therefore, to the extent that we persist in using traditional assessment procedures, we need to be reminded of their limitations. Dr. Heim's book does this concisely and appropriately, and is to be recommended on this account.

It is, as she also notes in the preface, written for the "more advanced student". Certainly, it should be regarded as essential reading for those who have completed introductory courses on psychological testing: it is the sort of book one could recommend to postgraduate students beginning their training in clinical, educational, and occupational psychology. Of particular value are the chapters on reliability and validity which cover aspects of these topics not generally examined in introductory texts.

The opening chapters contain discussions of the meaning and definition of intelligence and of the concepts of mental age and intelligence quotient. These, and the chapters on reliability and validity, do not "show their age", whereas a number of those remaining do. In particular, the chapters on the approach of the factor analysts, on speed and power, and on intelligence and environment, although their contents are relevant, could benefit from updating.

MICHAEL BERGER

Verbal Conditioning and Behaviour. J. P. DAS. Pergamon Press, Oxford, 1969, pp. vii + 163. $7.00. £2.60.

THIS BOOK reports mainly on a myriad of experiments (carried out by the author and his collaborators between 1957 and 1966) concerned with examining "verbal behaviour" within a classical-conditioning framework. The author has been greatly influenced by the Russian work in this area, and many of the reported experiments are extensions and replications of Soviet work. From the outset, Dr. Das distinguishes between "verbal conditioning" and "verbal operant conditioning", for reasons which are not altogether clear. Thus, the operant work of Skynner and his followers, which nowadays dominates the literature, is largely ignored, and instead the author concentrates on topics such as verbal probability learning, the persistence of conditioned affective meaning under reversal conditions, and hypnosis as a verbal conditioned reflex.

In the opinion of this reviewer, readers of this Journal will have to search hard in this book to find much of relevance to child development. Some experiments do use children or mental retarded adults as subjects, but the results are not placed against any broader framework of language development. Indeed, there is no reference in the book to the current work in developmental psycholinguistics. Any psychology book dealing with verbal behaviour which dismisses Skynner *en passant* and does not even mention Chomsky is clearly dealing with circumscribed, specialist topics. The publishers' "blurb" says that it is "intended chiefly for research workers and postgraduate students" but it is doubtful if even they will find this book easy to read.

WILLIAM YULE

J. Child Psychol. Psychiat., Vol. 12, 1971, p. 231. Pergamon Press. Printed in Great Britain.

ANNOUNCEMENT

INTERNATIONAL ASSOCIATION FOR CHILD PSYCHIATRY AND ALLIED PROFESSIONS ASSOCIATION INTERNATIONALE DE PSYCHIATRIE INFANTILE ET DES PROFESSIONS AFFILIÉES

8TH CONGRESS 29 JULY—2 AUGUST 1974

THE INTERNATIONAL Association for Child Psychiatry and Allied Professions, constituted by more than 30 member-organizations, announces its next International Congress will be devoted to a consideration of "The Vulnerable Child". This 8th Congress will be held in the U.S.A. from 29 July to 2 August, 1974.

The President of the I.A.C.P. and A.P., Professor E. J. Anthony (St. Louis, Mo.), announces that this meeting will be held in Philadelphia, Pennsylvania, where an Organizing Committee has already outlined a wide ranging program to forward the understanding of risk and mastery in childhood.

All inquries should be directed to:

DR. ALBERT J. SOLNIT (Secretary-General)
333 Cedar Street
New Haven
Connecticut 06510
U.S.A.

rhesus monkeys, separations during infancy

PENCER-BOOTH, YVETTE and HINDE, R. A. (1971) Effects of brief separations from
others during infancy on behaviour of rhesus monkeys 6–24 months later. *J. Child
sychol. Psychiat.* **12**, 157–172.

ummary—Data on mother–infant relations, activity, and behaviour in test situations
ere obtained from rhesus infants, age 12 and 30 months, which had had one or two
-day separation experiences when 20–32 weeks old, and from non-separated controls.
t 12 months the previously separated infants showed less locomotor activity than
ontrols, and some difference from them in mother–infant relations. There were no
gnificant differences in their readiness to approach strange objects in the home pen,
ut marked differences when they were tested in a strange cage. At 24 months some
ifferences were still present.

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own-home and institution-rearing, behavioural development, normal and mongol children

RANCIS, SARAH H. (1971) The effects of own-home and institution-rearing on the
ehavioural development of normal and mongol children. *J. Child Psychol. Psychiat.*
2, 173–190.

ummary—Differences in the frequency of different behaviours and the distribution
visual attention to different features in the environment were found for mongols and
ormal children (mental age below 2 yr) between those living at home with parents
nd those in institutions. The lower developmental level of institution-reared children
d not adequately account for these differences; it is suggested that different environ-
ental factors (e.g. availability of toys, use of restraint, amount of social contact), which
stinguished the environments from one another, were related to the behavioural dif-
rences. The latter were reduced when the institution environment was made more
ke the home environment. There were greater differences between institution and home-
ared mongols than between their normal counterparts; this was perhaps related to
e greater alertness and activity of normal children and the more depriving nature of
e mongols' institutions.

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behaviour problems, infant school children, compensatory education project

CHAZAN, MAURICE and JACKSON, SUSAN (1971) Behaviour problems in the infant school. *J. Child Psychol. Psychiat.* **12** 191–210.

Summary—This paper analyses information obtained from teachers relating to the incidence of behaviour problems in a sample of children in their first year in the infant school. Differences in the nature and extent of such problems are examined in terms of catchment area ("deprived"/"settled working class"/"middle class"; urban/rural) and sex. The views of the head teachers and teachers concerning the need for additional help or resources to deal with behaviour problems are discussed.

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socialization, conformity

KELVIN, PETER (1971) Socialization and conformity. *J. Child Psychol. Psychiat.* **12**
211–222.

Summary—The presenting symptoms of disturbance often take the form of "non
conforming" behaviour, suggesting "inadequate socialization"; conversely, the cours
of treatment is often evaluated by criteria of conformity and adequate socialization
The clinical situation thus touches on issues considered by social psychologists as well a
by clinicians themselves. This article presents a social-psychological analysis of socializa
tion. It examines the psychological function of socialization and the limitation o
conformity as a criterion of socialization. By implication it suggests that behavioura
conformity does not provide adequate criteria either for socialization or for the evalua
tion of treatment.

J. Child Psychol. Psychiat., Vol. 12, 1971, pp. 233 to 260. Pergamon Press. Printed in Great Britain.

PARENT–CHILD SEPARATION: PSYCHOLOGICAL EFFECTS ON THE CHILDREN

Michael Rutter

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INTRODUCTION

The importance of the family as a formative influence on a child's personality growth needs no arguing. Particularly in early childhood, it is the matrix within which the child develops, the area where his strongest emotional ties are formed and the background against which his most intense personal life is enacted (Lewis, 1956). The family is the most intimate, one of the most important and most studied of all human groups and yet our knowledge of it remains rudimentary (Anthony and Koupernik, 1970).

Misconceptions, myths and false knowledge on the effects of different patterns of child-rearing are rife. Generations of doctors, psychologists, nurses and educators have pontificated on what parents need to do in order to bring up their children to be healthy and well-adjusted adults. Over the last 50 years we have been exhorted in the name of mental health to suppress masturbation, to feed children by the clock, and then to let them gratify their impulses in whatever way they wish. (Stendler, 1950; Wolfenstein, 1953.) However, the claims that these policies were necessary for normal emotional development were made in the absence of supporting evidence. Research findings have failed to show any significant effects stemming from patterns of feeding, time of weaning, type of toilet-training and the like (Caldwell, 1964) and the consequences of different patterns of discipline appear surprisingly slight (Becker, 1964).

Uninterrupted mother-child contact has also been the subject of firm claims. Bowlby (1946) suggested that "prolonged separation of a child from his mother (or mother substitute) during the first five years of his life stands foremost among the causes of delinquent character development and persistent misbehaviour". More recently, he reiterated that because of its long-term consequences a child should be separated from his parents only in exceptional circumstances (Bowlby, 1958a; Bowlby, 1958b). These statements are arguable (O'Connor, 1956) but are cautious compared with those of some other writers. For example Baers (1954) claimed that the normal growth of children is dependent on the mother's *full-time* occupation in the role of child-rearing and that "anything that hinders women in the fulfilment of this mission must be regarded as contrary to human progress". Similarly, a W.H.O. Expert Committee (W.H.O., 1951) concluded that the use of day nurseries and crèches inevitably caused "permanent damage to the emotional health of a future

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*Paper presented at the Mental Health Research Fund, Sir Geoffrey Vickers Lecture (24 February 1971).

Accepted manuscript received 27 *July* 1971

generation". It is, perhaps, noteworthy that assertions of this kind have mostly been made by men and from the tenor of their comments we might well agree with Margaret Mead (1954) when she suggests that the campaign on the evils of mother–child separation is just another attempt by men to shackle women to the home. Nevertheless, it would be wrong to dismiss the argument on these grounds. If mother–child separation actually does lead to delinquent character formations and if care by fathers cannot compensate, then, however much the Women's Liberation Movement may protest, it is necessary for women to be tied to their children during the growing years.

But, first, we must know the facts. We are still not sufficiently in the habit of critically examining the facts about a question before arriving at our conclusions about it (Fletcher, 1966). Many of the statements I have quoted imply that we understand exactly what sort of upbringing a child needs and precisely which factors cause psychiatric disorder in children. But we do not, and it is our failure to *recognize* our ignorance which has led to these confident but contradictory claims. It is not the ignorance as such which is harmful but rather our "knowing" so many things that are not true. Our theories on the importance of the family have multiplied and become increasingly certain long before we know what are the facts the theories have to explain.

Of course, it would be quite futile to collect facts without a purpose. As Medawar (1967, 1969) has described so well, science consists of both discovery and proof, hypothesis and then careful testing to discriminate between alternative hypotheses.

My purpose in this paper is to illustrate this process with respect to family studies. In order to emphasize that research is the *act* of scientific enquiry, the *search* for truth and not the *statement* of knowledge, I am going to describe how my colleagues and I set out to answer just one simple question on the psychological effects of a child's separation from his mother. This question was chosen as one which has aroused great interest, which carries with it wide-ranging implications for community policies and which, as my introduction showed, has been the subject of very strong claims concerning its consequences.

The research method I will use is that of epidemiology. Epidemiology is simply the study of the distribution of disorders in a community together with an examination of how the distribution varies with particular environmental circumstances. Originally this was a technique used with great success in the study of the cause of infectious diseases and other medical conditions (Morris, 1957; Terris, 1964). On the other hand, it can also be used to study the social causes of psychiatric disorder (Lin and Standley, 1962; Shepherd and Cooper, 1964) and the psychological effects of family influences (Christensen, 1969). That is the way I shall be using it here.

In order to give some "feel" of the successive steps of research I will confine more detailed descriptions to the work carried out over the last ten years by my collaborators and myself. In doing this I should emphasize that I am speaking as the representative of a research team, or more accurately several research teams, and many of the ideas I express stem as much from them as from me.

However, the validity of any observation is upheld only when it is repeated in other independent investigations. There are now many family studies using a variety of methods (Christensen, 1964; Handel, 1967; Anthony and Koupernik, 1970) and I will try to point out which of our findings have been supported by other research.

MEASUREMENT OF FAMILY CHARACTERISTICS

The first task that faced us in our family studies was how to measure the family characteristics in which we were interested and how to assess children's psychological development. We wanted to determine what actually happened in the home with regard to different aspects of family life, and interview methods were developed for this purpose (Brown and Rutter, 1966; Rutter and Brown, 1966).

The interview served two quite distinct functions: (1) to obtain an accurate account of various events and happenings in the family (who put the children to bed, how often the parents played or talked with the children, how often they quarrelled and so forth), and (2) to provide a standard stimulus for eliciting emotions and attitudes (warmth, criticism, hostility, dissatisfaction and the like). Different techniques were necessary for these two aspects of the interview.

As our interviewing techniques have been outlined previously (Brown and Rutter, 1966; Rutter and Brown, 1966), I will merely state that some three years were spent in devising methods which could differentiate successfully between different aspects of family life. In particular it was found essential to distinguish between what people did in the home and what they felt about it—between the acts and the emotions accompanying the acts. It was also necessary to measure emotions separately in relation to different members of the family. Quite often parents may be very warm towards one child and yet rejecting another. Finally, it was important to consider negative and positive feelings separately. Frequently, people have "mixed" feelings, both loving and hating someone at the same time. Making these distinctions it proved possible to devise reasonably accurate measures of the central features of family life. Systematic investigation showed that the ratings had a satisfactory level of reliability and validity.

MEASUREMENT OF PSYCHIATRIC STATE

Similar care had to be taken in the measurement of the children's emotional and behavioural state. For this purpose we used both questionnaire and interview measures of behaviour in different situations. As with the family measures, the reliability and, as far as possible, the validity of the ratings were tested and found adequate (Rutter and Graham, 1968; Graham and Rutter, 1968; Rutter, 1967; Rutter, Tizard and Whitmore, 1970).

SAMPLES

The effects of different family influences on children's psychological development have been examined in several populations. For the purpose of this paper I will refer to only two—both of which, as it happens, were being studied primarily for other reasons. This has the advantage that we have a lot of information on additional aspects of children's circumstances and development which help to put the family findings into perspective.

The first group studied consisted of the families of 9–12-yr-old children living in a community of small towns—namely the Isle of Wight. This study* investigated the educational, physical, and psychiatric handicaps in school-age children (Rutter, Tizard and Whitmore, 1970; Rutter, Graham and Yule, 1970). The second sample was a representative group of London families, in which one or both parents had been under psychiatric care (Rutter, 1970b). The study† was designed to investigate the difficulties faced by families when one parent became sick, with the aim of determining to what extent their needs were being met by the current provision of services. In both cases we have been extremely fortunate in the co-operation we have received and we are most grateful to the many families who have helped us in this work.

PARENT–CHILD SEPARATION

So much for the background. Let me now consider the findings on the effects of parent–child separation. If separation is such a serious hazard to mental health as claimed, there are vital implications for public health policy and important opportunities for the prevention of psychiatric disorder. But are the claims true?

In order to answer that question we have first got to pose it more precisely. All children must separate from their parents at some time if they are to develop independent personalities. Furthermore, most youngsters experience some form of temporary separation from their parents during childhood. For example, Douglas (1966) found that one in three children were separated from their parents for at least 1 week before the age of 4½ yr. Obviously most of these turn out to be quite normal boys and girls so the question is not "should separation be allowed" but rather "what sort of separation, at what age, for how long, and for what reason leads to psychological disturbance?". Also, we need to specify separation from which parent? Most emphasis has been placed on *mother*–child separation, the father being regarded as a relatively insignificant figure with respect to a child's personality development. Is this so? Finally, it has been suggested that it is necessary for children to have a relationship with a *single* mother-figure and that harm will come if mothering is divided among several people. So the apparently simple question "is separation from their parents bad for children?" turns out to be quite complicated.

SHORT-TERM EFFECTS

In attempting to provide a solution to the problem it may be appropriate to begin with the short-term effects of parent–child separation. This has been most studied in children admitted to hospital. Bowlby and his colleagues noted the frequency with which children were upset after admission and described three phases to the disturbance (Bowlby, 1958, 1968, 1969; Robertson and Bowlby, 1952). First, the child cries and shows acute distress, the period of "*protest*", he then appears miserable and withdrawn, the phase of "*despair*", and finally there is a time when he seems to lose interest in his parents, the stage of "*detachment*". When the child returns to his parents he often ignores them at first and then becomes clinging and demanding.

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*This study was carried out in collaboration with Professor J. Tizard, Dr. K. Whitmore, Dr. P. Graham, Mr. W. Yule and Mr. L. Rigley.

†This study was undertaken together with Mrs. S. George, Dr. P. Graham, Miss B. Osborn, Mr. D. Quinton, Miss O. Rowlands, Miss C. Tupling and Mr. P. Ziffo.

Some investigators have failed to confirm these findings (Davenport and Werry, 1970) but on the whole the observations have received support from other studies (Yarrow, 1964; Vernon, Foley, Sipowicz and Schulman, 1965). Nevertheless, a number of important qualifications have had to be introduced. The response described is most marked in children aged 6 months–4 yr, but even at this age it occurs in only some children (Illingworth and Holt, 1955; Prugh *et al.*, 1953; Schaffer and Callender, 1959). Moreover, it is misleading to regard the separation as only from mother. While children at this age are often most attached to their mother they are also attached to their father and to their brothers and sisters (Ainsworth, 1967; Schaffer and Emerson, 1964). In the past the strength of these other attachments has often been underestimated. Their importance is shown by the finding that when children are admitted to hospital with their brother or sister they show less distress (Heinicke and Westheimer, 1965). Although the separation is probably the principal factor even in hospital admission the care during the separation is also relevant (Faust *et al.*, 1964; Prugh *et al.*, 1953).

Some of the reasons why children differ in their response to separation can be found in their temperamental characteristics prior to separation (Stacey *et al.*, 1970). Similar findings have been found in sub-human primates (Hinde, 1970). Finally, with regard to the short-term effects of separation it appears that children used to brief separations of a happy kind are less distressed by *unhappy* separations such as hospital admission (Stacey *et al.*, 1970). This last point suggests that in some circumstances separation experiences may actually be beneficial to the child.

In summary, children are not inevitably distressed by separation from their parents and we are beginning to learn what factors determine whether they are upset, and how we may take steps to diminish the emotional disturbance associated with separation. Even so, despite these qualifications the main point that a child's separation from his family is a potential cause of short-term distress and emotional disturbance, has received substantial support from research findings.

LONG-TERM EFFECTS

The next issue is what *long-term* effects follow separation experiences and this, rather than the immediate response to separation, is what my colleagues and I have been concerned to investigate. In order to discuss our findings it will be necessary to divide separation experiences into several categories. I will start with children whose mothers go out to work.

Working mothers

This is a situation which exemplifies both recurrent very brief separations and also maternal care which is provided by several or even many mother-figures. In the past it has been claimed that the children of working mothers are particularly likely to become delinquent or develop some form of psychiatric disorder. Little time need be spent on this topic as there is abundant evidence from numerous studies, including our own, that this is not so (Yudkin and Holme, 1963; Douglas *et al.*, 1968, Rutter, Tizard and Whitmore, 1970). Indeed, in some circumstances, children of working mothers may even be *less* likely to become delinquent (West, 1969). There is no evidence that children suffer from having several mother-figures so long as stable relationships and good care are provided by each (Moore, 1963). This is an important proviso but one which applies equally to mothers who are not working. A situation in which mother-figures keep changing so that the child does not have the opportunity of forming a relationship with any of them may well be harmful, but such unstable arrangements usually occur in association with poor quality maternal care, so that up to now it has not been possible to examine the effects of each independently.

Day nurseries and crèches have come in for particularly heavy criticism and, as already noted, the World Health Organization actually asserted that their use inevitably caused permanent psychological damage. There is *no* evidence in support of this view. Of course, day nurseries vary greatly in quality and some are quite poor. Bad child-care whether in day nurseries or at home is to be deplored but there is no reason to suppose that day nurseries, as such, have a deleterious influence. Indeed day care need not interfere with normal mother–child attachment (Caldwell *et al.*, 1970) and to date there is no reason to suppose that the use of day nurseries has any long-term ill-effects (Yudkin and Holme, 1963). Although the evidence is still incomplete, the same conclusions probably apply also to communities such as the Israeli kibbutzim where children are, in effect, raised in residential nurseries although retaining strong links with their parents (Miller, 1969; Irvine, 1966).

Why then have "experts" asserted that working mothers and day nurseries cause delinquency and psychiatric disorder? The claim was made in good faith but without substantiating evidence and subsequent research has shown the charge to be wrong. It is important that we listen carefully to the advice and testimony of individuals who have studied a problem, but it is equally important that we demand that they present the evidence relevant to their recommendations. Science does not consist of experts' answers, but rather of the process by which questions may be investigated and the means of determining the relative merits and demerits of different explanations and answers.

Transient separations

Transient parent–child separation can lead to acute short-term distress as already discussed. Can it also lead to long-term psychological disturbance? Several independent investigations have shown that children can be separated from their parents for quite long periods in early childhood with surprisingly little in the way of long-term ill-effects (Bowlby *et al.*, 1956; Naess, 1959*; Andry, 1960; Douglas *et al.*, 1968). Yet, most studies have shown that children subjected to separation experiences in early childhood do have a slightly increased risk of later psychological disturbance (Ainsworth, 1962) and it is necessary to explore the possible explanations

*A further study by Naess (1962) confirmed that prolonged separation experiences were no more frequent in delinquents than in controls, but also suggested that separations might be more frequent in a small group of serious delinquents. As this study is sometimes quoted in support of Bowlby's 1946 paper, it may be appropriate to give Naess' conclusions in full: "Our conclusion is that mother–child separation as such is a minor criminogenic factor; it does not stand 'foremost among the causes of a delinquent character development', but may be conceived as part of the picture of an unstable family life".

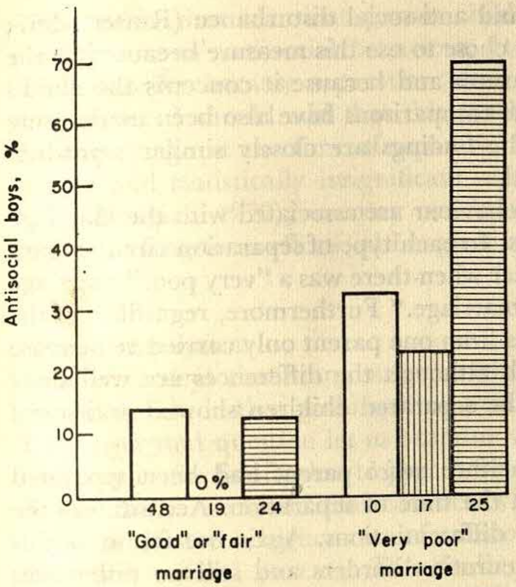

FIG. 1. Discord or separation as causes of anti-social behaviour in boys. □ No separation; ▥ Separation from one parent at a time; ▤ Separation both parents or institutional Care.

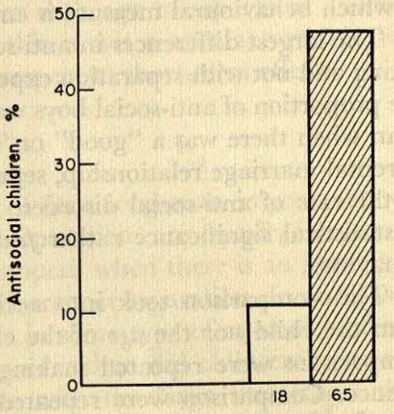

FIG. 2. Reasons for total parent–child separation and anti-social behaviour in children. □ Separation due to physical illness of holiday; ▨ Separation due to family discord or psychiatric illness.

On this and all subsequent figures the numbers at the base of the histogram refer to the number of cases for that column.

for this association. To do this we must examine more closely the nature of the separation experiences.

In our study of patients' families we divided separation experiences into those involving separation from one parent only and those involving separations from both parents at the same time. In each case separations were counted only if they had lasted at least four consecutive weeks.

It was immediately apparent that children separated from both parents came from more disturbed homes than did children who had never experienced separation. Many of the children were separated because they had been taken into care following some family crisis and often this occurs against a background of more long-standing difficulties (Schaffer and Schaffer, 1968).

As a measure of family disturbance we used one of our most reliable summary ratings on the quality of the parental marriage. This is based on a wide range of information concerning such items as affectional relationships between the parents, marital dissatisfaction, shared leisure activities, communication between husband and wife, mutual enjoyment of each other's company, quarrelling, tension and hostility.

Figure 1 (total $N = 151$) shows the association between parent–child separation and anti-social behaviour in boys, after controlling for the quality of the parental marriage. In this and in subsequent figures the measure of children's behaviour used is the score on a behavioural questionnaire completed by teachers (Rutter, 1967). This has been shown to be a reliable and valid instrument, and it can be scored to differentiate between neurotic and anti-social disturbance (Rutter, 1967; Rutter, Tizard and Whitmore, 1970). We chose to use this measure because it is the one most independent of our family measures and because it concerns the child's behaviour outside the home. However, the comparisons have also been made using more detailed clinical assessments and the findings are closely similar regardless of which behavioural measure is employed.

The largest differences in anti-social behaviour are associated with the marriage rating and not with separation experiences. In each type of separation circumstance the proportion of anti-social boys was higher when there was a "very poor" marriage than when there was a "good" or "fair" marriage.* Furthermore, regardless of the parental marriage relationship, separations from one parent only carried *no* increase in the rate of anti-social disorder. Indeed, although the differences are well short of statistical significance rather *fewer* of the separated children showed anti-social behaviour.

This comparison took into account neither *which* parent had been separated from the child nor the *age* of the child at the time of separation. Accordingly the comparisons were repeated making these differentiations. Again we found *no* difference. Comparison were repeated for neurotic disorders and still no differences were found. It may be concluded that in the sample studied there was *no* association between separation from one parent only and any type of psychiatric or behavioural disorder in children.

But there was an association between separation from *both* parents and anti-social disorder in the children. On the face of it this might seem to indicate that this type of separation experience is a factor leading to psychological disturbance in later childhood. But, it can be seen, that this difference applied *only* in homes where there was a very poor marriage relationship between the parents ($p < 0{\cdot}05$). No such difference was found in cases where there was a "fair" or "good" marriage. This difference according to the marriage rating suggests that the association may not be due to the fact of separation from both parents but rather to the discord and disturbance which surrounded the separation.

To investigate this possibility we divided separations from both parents into those due to some event *not* associated with discord (namely the child's admission to hospital for some physical illness or his going on a prolonged, usually convalescent, holiday), and those in which the separation was due to some deviance or discord. In the majority of cases this followed family break-up due to quarrels but in some instances separation was due to one parent having a mental disorder and the other parent being unable to keep the family together, the child staying with relatives or going into care.

As shown in Fig. 2 (total $N = 83$), it is the *reason* for the separation that mattered not the separation itself. When the children were separated from both their parents because of physical illness or a holiday, the rate of anti-social disorder was quite low. When the separation was due to some type of family discord or deviance, on the other hand, nearly half the children exhibited anti-social behaviour, a rate over four times as high as in the other children ($p < 0{\cdot}05$).

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*The marital rating scale has three main subdivisions, each being split into two parts making a 6-point scale in all. There are instructions for raters defining each point.

It seems that transient parent–child separation as such is unrelated to the development of anti-social behaviour. It only appears to be associated with anti-social disorder because separation often occurs as a result of family discord and disturbance. I should add that this conclusion still holds after taking into account the child's age at the time of separation. As other studies have produced contradictory and statistically insignificant associations with age of separation (Gibson, 1969; Douglas, 1970), we may conclude that this is not a crucial variable with respect to long-term effects, although it is with respect to short-term effects.

Permanent separations

If we accept that transient separations are of little long-term importance, can we also conclude that prolonged or permanent separations are equally innocuous? To answer that question let us examine what happens when there is an irreversible break-up of the family due to parental death, divorce, or separation. In our several family studies we found that children who were in some type of anomalous family situation showed a higher rate of anti-social disorder than did children living with their two natural parents. This finding agrees with the large literature linking "broken homes" with delinquency (Wootton, 1959; Yarrow, 1961, 1964; Rutter and Brown, 1966; Rutter, Graham and Yule, 1970; Rutter, Tizard and Whitmore, 1970) and it may be accepted as a fact that, overall, children from a broken home have an increased risk of delinquency. This association does not apply to neurosis but it may apply to some types of depression as well as to delinquency (Wardle, 1961; Caplan and Douglas, 1969).

But is this association due to parent–child separation, and if not, how is it to be explained? Bowlby (1952) has laid most emphasis on loss of the maternal figure and has suggested that disorder in the child arises from a disruption of the affectional bond with his mother or other parent substitute (Bowlby, 1968, 1969). Thus, he suggests that it is the separation or loss which is important and that the disorder in the child has some of the elements of grief and mourning (Bowlby and Parkes, 1970). This explanation may well be correct with respect to the short-term effects of mother–child separation (Heinicke and Westheimer, 1965), but there are good reasons for doubting the hypothesis with respect to long-term effects and it is these with which we are concerned here.

One important issue concerning the mechanisms involved in the association between "broken homes" and delinquency is whether the harm comes from disruption of bonds or distortion of relationships. This question may first be examined by comparing homes broken by death (where relationships are likely to have been fairly normal prior to the break), and homes broken by divorce or separation (where the break is likely to have been preceded by discord and quarrelling—or at least by a lack of warmth and affection). Figure 3 shows this comparison as made in three independent investigations.

In all three studies the delinquency rates are nearly *double* for boys whose parents had divorced or separated (Gregory, 1965; Douglas *et al.*, 1966; 1968; Gibson, 1969), but for boys who had lost a parent by death the delinquency rate was only slightly (and non-significantly) raised. In other studies, too, delinquency and con-

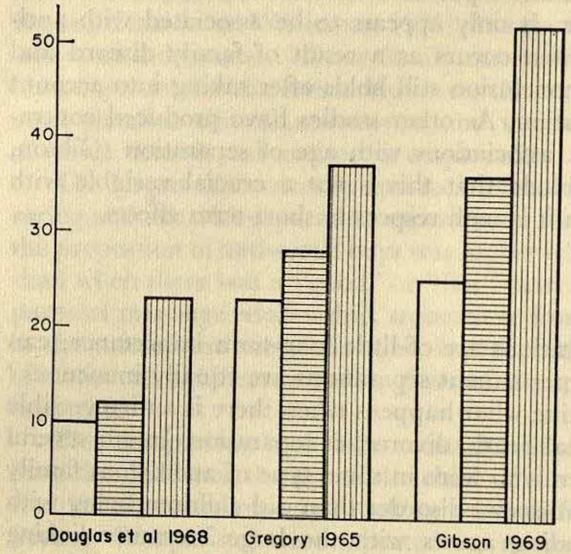

FIG. 3. Cause of family disruption and delinquency. □ Unbroken family; ▤ Broken by death; ▥ Broken by divorce/separation.

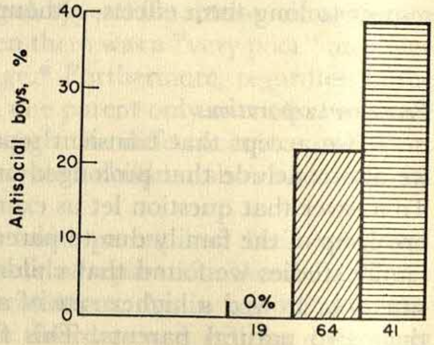

FIG. 4. Marital relationship and anti-social behaviour in boys living with both natural parents. □ Good marriage; ▨ Fair marriage; ▤ Very poor marriage.

duct disorders have been found to be associated with parental divorce or separation but *not* with parental death (Glueck and Glueck, 1950; Brown, 1966).

This suggests that it may be the discord and disharmony, rather than the break-up of the family as such, which lead to anti-social behaviour. To test that hypothesis it is first necessary to show directly that parental discord is associated with anti-social disorder in the children even when the home is unbroken. There is good evidence from several studies that this is the case (Craig and Glick, 1965; McCord and McCord, 1959; Tait and Hodges, 1962) and Fig. 4 (total $N = 124$) shows our own findings in this connection from the study of patients' families.*

The rate of disorder in boys rises steadily from 0% in homes where there is a "good" marriage to 22% when the marriage is "fair" to 39% when there is a "very poor" marriage (linear trend significant: $p < 0{\cdot}001$). Parental discord is associated with anti-social disorder in the children. However, we can take the matter one stage further. If parental discord is more important than break-up

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*These findings still apply after controlling for social class. In our sample parental occupation was not related to either the marriage rating or to anti-social behaviour. It is frequently assumed that delinquency is commoner in the lower social classes (Wootton, 1959) but the evidence is contradictory (Rutter *et al.*, 1970b). Furthermore, even in communities where social class is associated with behavioural disorder or delinquency in the children, this association often disappears once the effects of I.Q. are partialled out (Rutter *et al.*, 1970b) or family discord and disruption are taken into account (Conger and Miller, 1966; Langner *et al.*, 1969a, b; Robins and Hill, 1966). The association between social class and marital discord or family disorganization is also inconsistent; it applies in some communities but not in others (Barry, 1970; Christensen, 1964).

of the home as a cause of deviant behaviour, the rate of anti-social disorder should be higher for children living with their two natural, but unhappily married, parents than for children living in harmonious but broken homes. In our study we had too few cases of the latter variety for the comparison to be meaningful, but information is available from several other investigations which have shown that delinquency tends to be commoner in unhappy unbroken homes than in harmonious but broken ones (Jonsson, 1967; McCord and McCord, 1959). For example, the McCords (McCord and McCord, 1959) in a well-controlled study showed that broken homes resulted in significantly less juvenile delinquency than did unbroken but quarrelsome and neglecting homes.

The conclusions on "broken homes" are surprisingly straightforward. Although parental death may play a part in the pathogenesis of some disorders (Rutter and Brown, 1966; Schlesinger, 1969), delinquency is mainly associated with breaks which follow parental discord rather than with the loss of a parent as such. Even within the group of homes broken by divorce or separation, it appears that it is the discord prior to separation rather than the break itself which was the main adverse influence.

The present findings suggest that separation as such is of negligible importance in the causation of delinquency. It is important not to generalize too readily from the results of one study and it could be said that the sample studied was one with a rather high rate of family discord. Perhaps in families with happier relationships, separation experiences could be more influential in the causation of anti-social behaviour. Perhaps, but our evidence suggests not. In this study separation from both parents had some association with anti-social disorders when there was a "very poor" marriage, but none at all when there was a good marriage. As Gibson's findings (Gibson, 1969) were somewhat different it would be unwise to be dogmatic. I cannot state that separation experiences have no adverse effects on a child's psychological development. What we can conclude is that, at most, they can only be a minor factor in the development of delinquent behaviour.

Could it be, though, that we have been looking at the wrong index of psychological development? Maybe separations lead to neurosis rather than delinquency. The evidence is firmly against this proposition. Separation experiences of any kind have never been shown to be associated with child neurosis (Rutter, Graham and Yule, 1970; Rutter, Tizard and Whitmore, 1970). Indeed, we know surprisingly little about the causes of child neurosis. Disturbed family relationships are associated with anti-social behaviour but not neurosis. Family disruption has been associated also with depression (Caplan and Douglas, 1969) and with enuresis (Douglas, 1970), but in neither case has it been shown that the disorders are due to separation as such rather than with the family disturbance surrounding separation.

Lastly, in defence of the proposition that separation *per se* is an adverse factor it might be suggested that there is a delayed effect, that the ill-effects are to be found in adult life not in childhood. This remains a possibility. Some studies have suggested that bereavement in childhood is followed by depressive disorders in adult life (Brown, 1961; Dennehy, 1966; Hill and Price, 1967). However, other studies have found this association only in severe depression (Munro, 1966; Munro and Griffiths, 1969; Birtchenall, 1970) and yet others have not found it at all (Brill and Liston;

1966; Pitts *et al.*, 1965; Gregory, 1966; Abrahams and Whitlock, 1969). It remains uncertain whether or not this is a valid finding. Even if it is, it is probably of little relevance to the present discussion in that most studies indicate that the association is particularly with deaths during *adolescence*, not early childhood. We may still conclude that parent–child separation in early childhood, in itself, is probably of little consequence as a cause of serious long-term psychological disturbance.

This is not to say that separation experiences in early childhood are without long-term effect. Unhappy separations in a *few* children may lead to clinging behaviour lasting many months or even a year or so. These experiences may also render the child more likely to be distressed by separations when older. However, many children show *no* such long-term effects and even in those that do the effects are generally relatively minor. Serious sequelae are so rare that taken overall they are of very little pathogenic importance.

Parental death and delinquency

Before discussing the effects of parental discord we should pause for just a moment to consider why parental death is followed by *any* increase in disorder. Although in the delinquency studies quoted in an earlier figure the differences were small and statistically not significant, there was an apparent trend for parental death to be associated with a slight increase in delinquency. If it is, and the evidence is only weakly suggestive, does it mean that, after all, parent–child separation is of some importance in its own right, even if it is a minor influence compared with parental discord. Possibly, but there are other equally plausible explanations (Birtchenall, 1969). In the first place, death often follows a long illness and it has been shown that chronic physical illness (probably by virtue of the accompanying emotional distress and tension) may be associated with an increased risk of disorder in the children (Rutter, 1966). A second factor is the grief of the surviving parent, which often lasts as long as 2 yr (Marris, 1958). Children may well be more affected by the distress and emotional disorder of the bereaved parent than they are by the death of the other. Thirdly, families in which a father dies tend to be characterized by other adverse factors and the death is frequently followed by economic and social deterioration (Rowntree, 1955; Douglas *et al.*, 1968). Again, these may be more important than the death itself. At the moment, we do not know which of these influences is the greater. It is clear that when a parent dies the situation is much more complex than just a disruption of parent–child relationship. The association between parental death and delinquency is quite weak and even this weak association may not be attributable to parent–child separation.

Parental discord and disharmony

We should now return to a more detailed consideration of the effects of parental discord and disharmony. If left at this stage we are really saying little more than "bad homes lead to bad children", which does not take us very far. In order for the association to have much theoretical or practical value we have to go on to ask in more detail about how long disharmony has to last before the child is affected, how permanent are its effects, what sorts of disharmony are particularly associated with anti-social behaviour, what factors in the home may mitigate the effects of discord and tension, and what factors in the child determine why only some children are affected by quarrelsome homes. At the present time we have only partial answers to some of these questions but let us see how far the analysis of findings from our own study can take us.

We have no direct measure of the duration of discord and tension in the home but we do have some indirect measures in the study of patients' families, all of which suggest that the longer the tension lasts the more likely the children are to develop anti-social problems. First, we can look at children going through their second experience of a home with unhappily married parents. When children have experienced parental discord followed by divorce and then after the parents remarry, a second very poor marriage, the rate of disorder is double that for children going through the first experience of parents who cannot get on together ($p < 0{\cdot}05$). Secondly, where children were separated from their parents in early childhood because of family discord and were *still* in a quarrelsome home at the time we interviewed the parents, the rate of anti-social disorder was again unusually high (see Fig. 5). Thirdly, within homes with a very poor marriage the children were more likely to be deviant if one or both parents had shown impaired personal relationships throughout the whole of their adult life (see Fig. 11). In each case the differences were large and statistically significant. The evidence is circumstantial but it strongly suggests that the longer the family disharmony lasts the greater the risk to the children. However we have no findings which enable any estimate of how long there must be disharmony before there is any effect on the children.

But we can look at what happens when disharmony *stops*, in order to determine whether the ill-effects of bad family relationships in early childhood are transient or permanent. Figure 5 (total $N = 65$) shows the findings on children all of whom were separated from their parents through family discord or deviance. It compares those whose present family situation is still very poor with those whose present situation is fair or good. In most cases the family situation remained rather unsatisfactory and there were only a few children living in happy and harmonious homes. Accordingly, the comparison more accurately concerns children with very poor homes and children with less poor homes. Nevertheless, there is a large and significant difference ($p < 0{\cdot}05$); the rate of anti-social disorder was double in children currently in a very poor family situation. The effects are *not* permanent and given a change for the better in the family situation the outlook for the child's psychological development correspondingly improves. How readily, how completely and how often the adverse effects of disturbed relationships in early childhood may be reversed, we cannot answer. That remains one of the many important questions requiring further research.

The next issue is what *type* of family disharmony leads to anti-social disorder in the children. Broadly speaking, unhappy families can be divided into those where there is active disturbance (quarrelling, hostility, fighting and the like) and those which merely lack positive feelings (where relationships are cold and formal and the home is characterized by emotional uninvolvement and lack of concern).

Figure 6 (total $N = 103$) compares these two situations. As a measure of active disturbance I have taken "tension" a rating which reflects the extent to which discord leads to a persistent atmosphere in the home so that visitors sense the disharmony and feel ill at ease. The warmth rating assesses positive feelings. It is based on feelings expressed by the parents at interview in terms of tone of voice, facial expression and words used. It has been shown to be a reliable measure which accurately predicts emotional expression in other situations. A rating of "low" warmth means that *both* the parent–child *and* the husband–wife relationship lacked warmth. This is a rather infrequent situation so that the numbers are small. In particular, there needs to be study of more families where there is low warmth but also low tension. However, it seems that there is an interaction effect. There is little disorder in the children when there is low tension but when there is high tension the rate of disorder is significantly higher ($p < 0\cdot05$) if there is also low warmth. In short, both a lack of feeling and active discord are associated with deviant behaviour in the children.

This last comparison did not differentiate between the marital relationship and the parent–child relationship. So the next Fig. 7 makes this comparison with regard to warmth (total $N = 104$). On the whole, adults who are warm towards their spouse are also warm towards their children so that the number of cases when the two are discrepant is small. Nevertheless (although the differences fall just short of statistical significance), it does seem that the rate of anti-social behaviour in the children is raised if *either* relationship lacks warmth; the rate is particularly high if both relationships are cold.

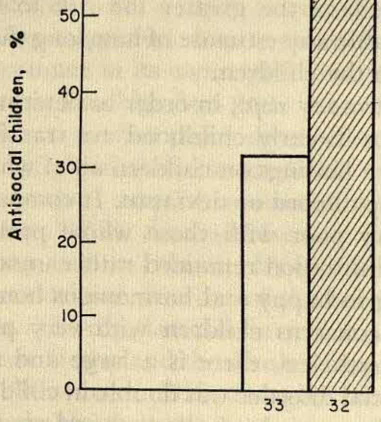

FIG. 5. Anti-social behaviour in children previously separated through family discord/deviance in relation to current family situation. □ Current family situation fair or good; ▨ Current family situation very poor.

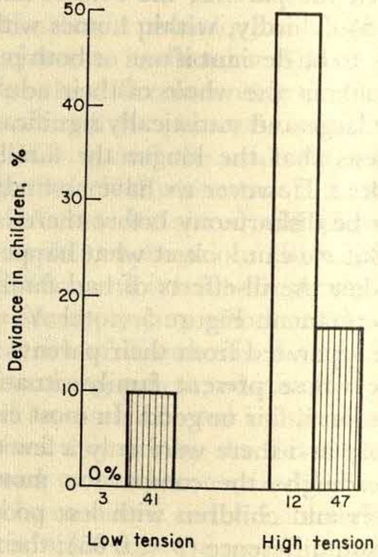

FIG. 6. Warmth/tension in the home and anti-social behaviour in the children. □ Low warmth; ▥ High warmth.

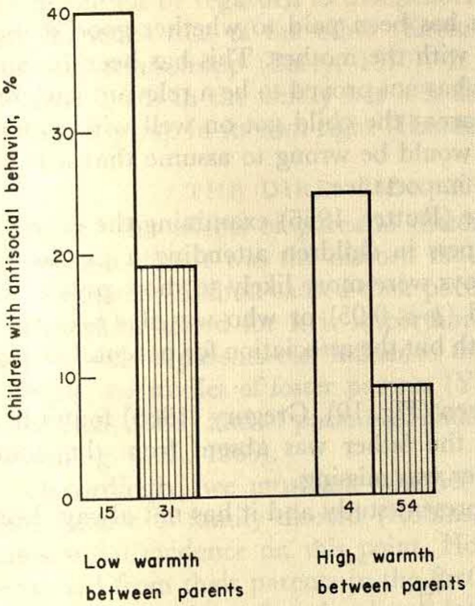

FIG. 7. Warmth in family relationships and anti-social behaviour in the children. ☐ Low warmth to children; ▥ High warmth to children.

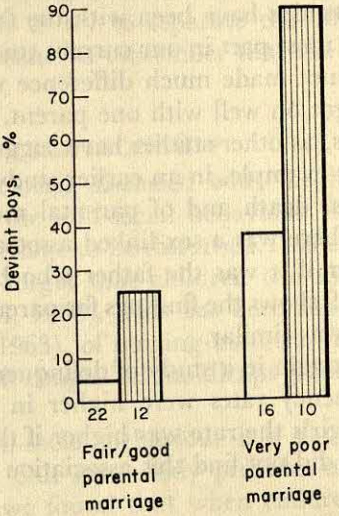

FIG. 8. Parent/child relationships, parental marriage and deviant behaviour in boys. ☐ Good relationship with one or both parents; ▥ Poor relationship with both parents.

Quite often in clinical practice one is faced with the problem of a very disturbed home situation with one parent behaving in a very deviant fashion but yet with the child still having a good relationship with the other parent. The question then is: "to what extent can a good relationship with one parent 'make up' for a family life which is grossly disturbed in all other respects?". Figure 8 (total $N = 60$) shows a comparison which provides some answer to this question. Families were first divided according to the quality of the marriage relationship and then within each marriage rating a comparison was made between children who had a good relationship with one parent and children who had a good relationship with neither parent For this purpose, a good relationship was defined in terms of the parent expressing both positive warmth *and* very little negative feeling. No account was taken of the child's behaviour toward the parent in making the rating.

There was again an interaction effect. Whatever the parent–child relationship the rate of disorder in the sons was significantly higher ($p < 0{\cdot}05$ for good parent–child relationship and $p < 0{\cdot}01$ for poor parent–child relationship) if the marital relationship was bad. Conversely, whatever the marital relationship the child was better off if he had a good relationship with at least one parent ($p < 0{\cdot}05$ for difference within "very poor" marriage). A good relationship with one parent was *not* sufficient to remove the adverse effect of marital discord but it could go quite a long way in mitigating its effects.

Father–child and mother–child relationships

So far, in this talk not much attention has been paid to whether good or bad relationships have been with the father or with the mother. This has been because for the most part in our current studies this has not proved to be a relevant variable. It has not made much difference which parent the child got on well with so long as he got on well with one parent. Yet, it would be wrong to assume that it never matters, as other studies have suggested its importance.

For example, in an earlier study of mine (Rutter, 1966) examining the effects of parental death and of parental mental illness in children attending a psychiatric clinic there was a sex-linked association. Boys were more likely to show psychiatric disorder if it was the father who had died ($p < 0\cdot05$) or who was ill ($p < 0\cdot05$). Figure 9 shows the findings for parental death but the association for parental mental illness was similar.

Or again in a study of delinquent children (Fig. 10), Gregory (1965) found that delinquency rates were higher in boys if the father was absent from the home but in girls the rate was higher if the mother was missing.

We did not find this association in the present study and it has not always been found in other investigations (Gibson, 1969) so that the matter must remain open for the moment. It may be that the importance of the same-sexed parent is marked only at certain ages, perhaps in adolescence. The issue requires further study.

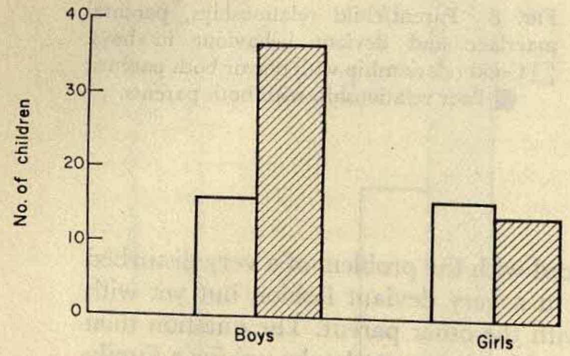

FIG. 9. Association between sex of dead parent and sex of child attending psychiatric clinic. □ Mother dead; ▨ Father dead.

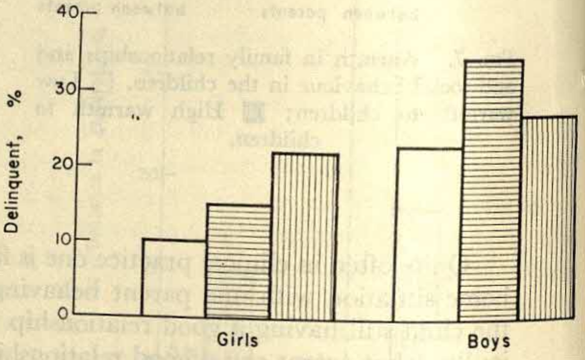

FIG. 10 Family composition and delinquency. □ Child with both parents; ▤ Father absent; ▥ Mother absent.

I have touched on the subject here, in spite of the inconclusive findings, because, however the problem is finally resolved, it is evident that the father–child relationship is an important one, and in some circumstances it may even be more influential than the mother–child relationship (Peterson *et al.*, 1959; Bronfenbrenner, 1961; Robins, 1966). Of course, it is also true that mothers generally have more contact with very young children and her influence on them often predominates (Wolff and Acton, 1968). The point, quite simply, is that both parents are important with respect to their children's development and which parent is more important varies with the situation and with the child. It should be added that the influence of each parent cannot be regarded as independent factors. The mental health of one parent may influence that of the other (Kreitman *et al.*, 1970) and may also affect the marriage relationship (Barry, 1970). It is useful to try to separate the effects of different dyads in the family but it is also important to remember that the family is a social group in its own right (Handel, 1967).

THE DIRECTION OF THE RELATIONSHIP

So far the effects of parental discord have been discussed with the implicit assumption that it was the discord that led to the anti-social behaviour, not that the anti-social children caused their parents' marriage to be disturbed. This assumption must be tested for it is important not to forget that children can influence parents just as parents can influence them (Bell, 1968). This has been shown, for example, by studies of foster parents (Yarrow, 1963), of nursing mothers (Yarrow, 1963; Bell, 1968) and of parents of children with congenital handicaps (Bell, 1964; Cummings *et al.*, 1966).

Accordingly, we must ask whether the anti-social behaviour is a cause or a consequence of family discord (Robins, 1969). Our own study provides only circumstantial evidence on this point. However, we found that when children were separated from their parents in the first few years of life because of family discord, anti-social disorders often developed later. In some of these cases the marital difficulties must have preceded the child's birth because older children had already been taken into care following some family crisis.

Other investigations have measured parental behaviour when the children were young and then have followed the development of the children into early adolescence. These studies have shown that it is possible, on the basis of the early family assessment, to predict the development of later delinquency at a considerably better than chance level (Craig and Glick, 1965; Tait and Hodges, 1962; West, 1969).

The effects are not entirely unidirectional and a circular process is probable (Yarrow, 1968) but we may conclude that parental discord can start off a maladaptive process which leads to anti-social disorder in the children. This may fairly be regarded as a causal relationship.

PARENTAL PERSONALITY

Genuine and spurious relationships have still to be distinguished (Hirschi and Selvin, 1967). Because parental discord leads to later anti-social behaviour it does not necessarily follow that it is the discord itself which is the cause of the anti-social disorder. It could be that the discord is only important because it is associated with some other factor of a more basic kind. One possible factor of this kind is parental personality. In many of the very bad marriages one or both parents had a gross personality disorder. Was this the more basic factor? Were the children anti-social because their parents were abnormal rather than because the home was unhappy? Figure 11 (total $N = 70$) shows findings relevant to that question.

Families have been sub-divided both according to the quality of the marriage, as before, and also on the basis of whether either parent showed a handicapping personality disorder. Much the most important factor in relation to anti-social disorder in the sons was the parental marriage rating. Regardless of whether one

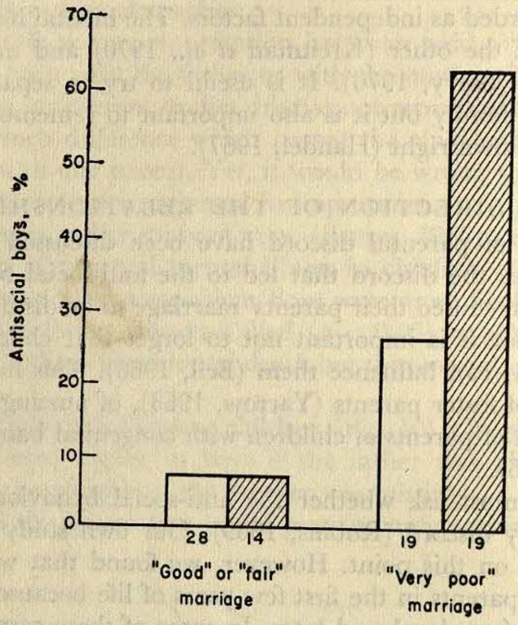

FIG. 11. Personality of parents, parental marriage and anti-social behaviour in boys. ☐ Neither parent has personality disorder; ▨ One or both parents have personality disorder.

parent had a personality disorder anti-social behaviour was many times more common when the marriage was "very poor" than when it was "good" or "fair". Furthermore, within the group of families with a satisfactory marriage there was *no* effect attributable to parental personality disorder. These findings make it most unlikely that the association between parental discord and anti-social disorder is due to the presence of abnormalities of personality in the parent.

Even so, the difference associated with parental personality within the families with a "very poor" marriage requires explanation although the difference falls just short of statistical significance at the 5% level ($\chi^2 = 3{\cdot}832$). By definition, the parents with a personality disorder had shown disordered behaviour or relationships throughout their adult life and in most cases this was associated with prolonged marital discord (in some cases this having occurred throughout two marriages). We do not have a measure of the duration of marital discord but it is highly probable that discord was of much longer duration when one parent had a personality disorder. Whether this is so, and if so, whether it accounts for the difference is not known. All that can be said is that regardless of whether or not a parental personality disorder acts as a contributory factor in the causation of anti-social disorder its influence is not such as to account for the effects of parental discord.

GENETIC INFLUENCES

This result makes it less likely that the association between parental discord and anti-social disorder in the children could be explicable in genetic terms, but this possibility must be examined. The whole association could be accounted for in terms of heredity if a gene led both to delinquent behaviour and to personality difficulties giving rise to marital disharmony. Again this could not be tested directly but other studies allow an indirect test of the hypothesis. A recent Swedish study by Bohman (1970) examined deviant behaviour in *adopted* children in relation to characteristics of the children's biological parents. Information was available on criminality and alcohol abuse in the true fathers who, of course, had no contact with the children. Bohman (1970) found *no* association between these characteristics of the true fathers and deviant behaviour in the adopted children. This negative result stands in sharp contrast to the findings of many studies that criminality and alcoholism *are* associated with deviant behaviour in the children when the children are brought up by their criminal or alcoholic parents (Nylander, 1960; Robins, 1966; Jonsson, 1967). This finding and similar findings from studies of foster children (Roe and Burks, 1945) strongly suggests that the passing on of delinquent behaviour from parent to child largely involves environmental rather than genetic influences.

Twin studies also suggest that genetic factors play but a small part in the pathogenesis of delinquency (Rosanoff *et al.*, 1941; Shields, 1954; 1968). The concordance of monozygotic pairs with regard to anti-social disorders is only slightly greater than that of dizygotic pairs, showing that genetic factors have only a minor influence. That concordance rates are high in both types of twins suggests the importance of familial influences of an environmental type.

In short, the evidence shows that delinquent behaviour is not inherited as such and that personality disorders in the parents probably lead to anti-social difficulties in the children through their association with family discord and disturbance rather than through any direct genetic influence. Of course, that is not to say that genetic factors play no part. They probably are of importance with respect to the temperamental featuers which render children more susceptible to psychological stress (see below).

FACTORS IN THE CHILD

In concentrating, as I have for the purpose of this paper, on the effects associated with family discord, it should not be thought that I am suggesting that this is the only factor involved in the causation of anti-social behaviour. Obviously it is not. Other studies have shown that a variety of social, cultural, psychological and biological factors all play a part in the genesis of delinquency (West, 1967). The Tower Hamlets studies of Power and his colleagues (Power *et al.*, 1967) suggest that factors in the school as well as in the home may be important. In addition, there are a number of factors in the child himself which may make him more likely to develop some type of behavioural disorder. For example, our own studies on the Isle of Wight showed that children with organic brain disorders were more likely to develop deviant behaviour (Rutter, Graham and Yule, 1970) and that children with severe reading difficulties were especially prone to exhibit anti-social tendencies (Rutter, Tizard and Whitmore, 1970).

However, at the moment we can only be concerned with the factors which aggravate or ameliorate the adverse influence of family discord. In this connection there are two factors in the child which have to be discussed.

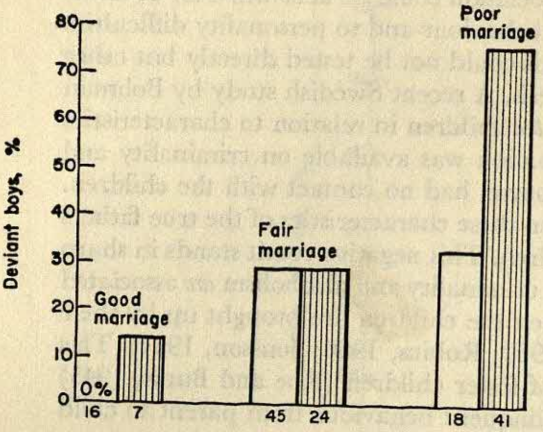

FIG. 12. Personality of patient, parental marriage and deviant behaviour in boys. □ Parent/patient has normal personality; ▥ Parent/patient has personality disorder. Unlike Fig. 11, Figs. 12 and 13 refer to personality disorder in the patient alone (not both parents). This information was available on a larger sample.

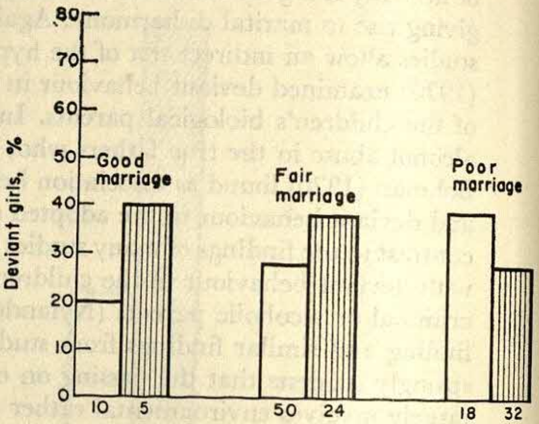

FIG. 13. Personality of patient, parental marriage and deviant behaviour in girls. □ Parent/patient has normal personality; ▥ Parent/patient has personality disorder.

Sex

The first of these is the child's sex. Nearly all the findings mentioned so far have referred to boys. This is not accidental. In our studies the effects of parental discord have been found to be much more marked in boys than in girls. The size of this difference is illustrated in Figs. 12 and 13. Figure 12 (total $N = 151$) shows the association between marital disharmony and deviant behaviour in boys. As noted previously, the rate of deviant behaviour rises steeply the worse the parental marriage, and there is an association with parental personality disorder.

In girls this association was not found (Fig. 13; total $N = 139$). The rate of deviant behaviour was much the same in girls regardless of whether a parent had an abnormal personality and regardless of the state of the parental marriage. This implies that boys may be more susceptible to the effects of family discord than are girls. The evidence from other studies is incomplete and rather unsatisfactory but there does seem to be a tendency for the male to succumb more readily to psychological stresses (Rutter, 1970), in parallel perhaps with the very well-documented finding that the male is much more susceptible to biological stresses (Rutter, 1970; Tanner, 1968). The evidence on children's responses to acute separation is somewhat contradictory but both in humans and in sub-human primates there is some suggestion that the young male may be more vulnerable (Vernon *et al.*, 1965; Stacey *et al.*, 1970; Sackett, 1969; Hinde, 1970). The matter is far from settled at the moment and further research is required, but on the whole the evidence tends to point to the male being more likely to suffer from the ill-effects of parent–child separation and family discord.

Temperamental make-up

The other factor in the child which we have to consider is his temperamental make-up. There is now substantial evidence that, even in the infancy period, children differ sharply one from another (Berger and Passingham, 1971, in press). The young child responds selectively to stimuli in terms of his idiosyncratic and developmental characteristics; to a considerable extent he *elicits* responses from other people (Yarrow, 1968). Thomas and his colleagues in New York have shown that it is possible to measure the temperamental attributes of young children (Thomas *et al.*, 1963). In the course of a longitudinal study, they have followed a group of children from soon after birth up to middle childhood. A proportion of the children have developed emotional and behavioural difficulties and it has been found that the children's temperamental attributes as measured at the age of 1–3 yr were associated with the development of behavioural difficulties a few years later (Rutter *et al.*, 1963). Children who were irregular in their eating and sleeping habits, who were very intense in their emotional responses, who adapted slowly to new situations and who showed much negative mood were those most likely to develop behavioural problems. This study showed that a child's own characteristics influenced the development of emotional and behavioural disorders and it seemed that it did so through effects on parent–child interaction (Thomas *et al.*, 1968).

In our study of patients' families* we investigated children's temperamental attributes in a somewhat similar way. These were assessed when the children were 4–8-yr-old and the influence of temperament was measured against behavioural deviance in the school (i.e. in a different situation) 1 yr later. Figure 14 shows the findings.

Children who lacked fastidiousness (that is, they did not mind messiness and disorder) were significantly more likely ($p < 0{\cdot}05$) to show deviant behaviour

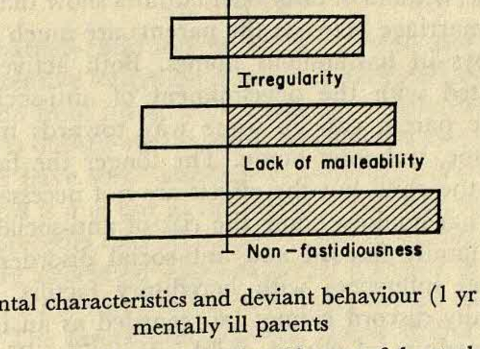

FIG. 14. Temperamental characteristics and deviant behaviour (1 yr later) in children of mentally ill parents

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*Dr. Philip Graham was responsible for planning this part of the study.

1 yr later. The same was true of children who lacked malleability ($p < 0{\cdot}05$), whose behaviour was difficult to change (a measure quite similar to the New York group's category of non-adaptability). As in the New York study, children who were markedly irregular in their eating and sleeping patterns were also more likely to develop behavioural problems ($p < 0{\cdot}01$). There was a similar, but statistically insignificant ($p < 0{\cdot}2$), tendency for highly active children to be at greater risk.

The findings demonstrated that children differed in their susceptibility to family stress and they showed which temperamental attributes were important in this respect. The attributes were not ones concerned with deviance but rather were features which determined *how* a child interacted with his environment. That we were measuring more than just aspects of deviant behaviour is suggested by the finding that the attributes tended to have a stronger association with deviance 1 yr later than with deviance at the time. Furthermore, the association was as strong with respect to the child's deviance at school as at home in spite of the fact that temperament was assessed only in relation to the child's mode of behaviour when with his family.

It is no new observation that children differ in their responses to stress situations but until recent years surprisingly little attention has been paid to this side of parent–child interaction. It warrants further study and the dividends of such study should be great.

THEORETICAL EXPLANATIONS

It has been found that a child's separation from his family constitutes a potential cause of short-term distress, but that separation is of little direct importance as a cause of long-term disorder. Moreover, even the short-term effects cannot be regarded solely as a response to maternal separation. Other family members are also very important in this context. Although separation experiences have an association with the later development of anti-social behaviour, this is due, not to the fact of separation itself, but rather to the family discord which accompanies the separation. The same applies to the more permanent separations due to family disruption consequent upon parental death or divorce. For the most part, the child is adversely affected by the tension and disharmony; the break-up of the family is only a minor influence. Studies of unbroken families show that boys in homes where there is an unhappy marriage between the parents are much more likely to become deviant than are boys in harmonious homes. Both active discord and lack of affection are associated with the development of anti-social disorders. A good relationship with one parent can go some way towards mitigating the harmful effect of a quarrelsome, unhappy home. The longer the family discord lasts the greater the effect on the child but the effects are not necessarily permanent. If the child later lives in a harmonious home the risk of anti-social problems drops. The association between family discord and anti-social disorders seems to be largely due to environmental influences with hereditary factors of lesser importance. Nevertheless, the family discord cannot be regarded as an independent influence; it acts through the medium of parent–child interaction. This is a dyad in which the child also plays an active role and both the child's sex and his temperament attributes have been shown to affect the interaction.

While these findings have added to our understanding of the long-term consequences of family disruption, this is far from the end of the problem, although it is where we will have to leave it today. I should just remind you that we have still to determine the psychological mechanisms involved. *Why* and *how* does family discord interact with a child's temperamental characteristics to produce anti-social behaviour?

Let me conclude with three suggestions on possible mechanisms. First, there is evidence from both retrospective and prospective studies that the parents of delinquent boys differ from other parents in their approach to the discipline and supervision of their children (Glueck and Glueck, 1962; West, 1969; Sprott *et al.*, 1955; Craig and Glick, 1965). Could it be that it is the child-rearing practices which are the main factor in the causation of delinquency and that the discord is important only in so far as it is associated with erratic and deviant methods of bringing up children? Secondly, experimental studies have shown how readily children imitate other people's behaviour and how a model of aggressive or deviant behaviour may influence the children to behave similarly (Bandura, 1969). Perhaps the family discord is important only because it provides the child with a model of aggression, inconsistency, hostility and anti-social behaviour which he copies. The third alternative is that the child learns social behaviour through having a warm stable relationship with his parents, that this relationship provides a means of learning how to get on with other people and that difficulties in interpersonal relationships constitute the basis of anti-social conduct.

It is not difficult to think of situations in which these three hypotheses lead to different predictions, but that is another story. We have come a long way from the simple question with which we started: "is separation from their parents bad for children?". The conclusions from research suggest a more complex interaction than that implied in the original question, but one which is still susceptible to critical analysis. There is some distance yet to go before we understand the mechanisms and processes by which family life helps shape children's psychological development. However, the problems are soluble and the solutions should be of practical importance in knowing how best to help children and families who are going through a period of psychological difficulties.

SUMMARY

The literature on parent–child separation is reviewed and findings are reported from a detailed and intensive longitudinal study of patients' families. It is concluded that a child's separation from his family constitutes a potential cause of short-term distress but separation is of little direct importance as a cause of long-term disorder. Separation experiences have some association with the later development of anti-social behaviour but this is due not to the fact of separation itself, but rather to the family discord which precedes and accompanies the separation. Both active discord and lack of affection are associated with anti-social disorder but a good relationship with one parent can go some way toward mitigating the harmful effect of a quarrelsome unhappy home. The association between family disharmony and anti-social

disorder is probably largely mediated by environmental influences. Children differ in their response to family discord; these differences are associated with both sex and temperamental factors.

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SEX DIFFERENCES IN BEHAVIOURAL IMPULSIVITY, INTELLECTUAL IMPULSIVITY, AND ATTAINMENT IN YOUNG CHILDREN

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INTRODUCTION

THIS STUDY is concerned with a hypothesis that Maccoby (1967) put forward to explain a tendency for an "impulsive-active" factor to be positively related to intellectual performance measures for girls, and for its opposite, an "inhibited-passive" factor to be positively related for boys. The studies that give rise to this generalization have been reviewed by Maccoby (*op. cit.*), and therefore only a limited selection will be outlined here.

A typical study is that of Sutton Smith *et al.* (1964) who found that winning a game of "tic–tac–toe" (known to be related to I.Q.) was characteristic of girls who were hyperactive and dominant, yet characteristic of boys who were not hyperactive and who preferred "conceptual recreations". Similarly, using "analytic groupings" as a performance measure, both Sigel *et al.* (1963) and Kagan *et al.* (1964) found that a factor they called emotional control (both studies), and cautiousness and attentiveness (Sigel *et al*, 1963), correlated positively for boys and negatively for girls. Again, in a longitudinal study, Kagan and Moss (1962) reported that hyperkinesis during childhood correlated negatively with adult intellectual interests for men, and slightly positively for women, and that observed dependency behaviour in these same children had been negatively correlated with I.Q. for girls and slightly positively correlated for boys. Maccoby (1967) lists other studies with similar findings, and together these produce a fairly consistent picture. All these studies are American, but the British study of Entwistle and Cunningham (1968) shows results that support the trend. This study used a very large sample and the finding that extraversion was positively related to school attainment for girls, whilst introversion was positively related for boys, can be taken to be highly reliable. The typical descriptions of extraverts and introverts brings this study into line with the transatlantic studies. Although there have been contrary findings, and the relationships have often been comparatively small, the accumulated evidence suggests that there is a phenomenon that is in need of explanation.

Maccoby's (1967) suggested explanation of these findings is reminiscent of the Yerkes–Dodson Law, and is based on the assumptions that there is a unitary dimension running from bold, impulsive and hyperactive behaviour at one extreme, to passive and inhibited at the other, and that this scale is curvilinearly related to performance. The curvilinearity is proposed on the intuitive argument that extreme inactivity, on the one hand, and extreme activity, on the other, would lead to too

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little, and too fleeting, contacts with "experience" respectively, but that towards some midpoint there would be sufficient interaction with the environment, at an appropriate "rate", for learning to take place. Measured performance is held to be a measure of this learning.

If it is further assumed that boys, as a group, tend to be active, impulsive and bold, whilst girls, as a group, tend to be passive and inhibited, then the relationships that can be asserted are shown in Fig. 1. These relationships would lead to the hypothesis that factors tending to make girls more active would be positively correlated with performance, whilst factors tending to make boys more passive would be positively correlated with their performance. The nature of the relationship is such, however, that if a girl moved to the extreme activity end of the dimension then her performance would deteriorate. The hypothesis is thus that there is an optimum point on the activity dimension, and that this is identical for both boys and girls. Stated more formally, the hypotheses that derive from this proposed explanation are that:

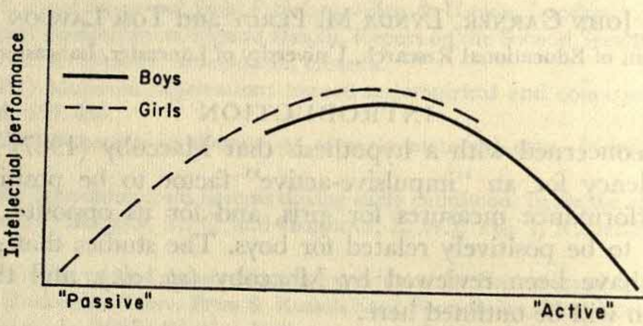

FIG. 1. Proposed relationship between impulsivity and performance.

(1) Boys will be more active and impulsive than girls;
(2) Individuals with high and low scores on an active/impulse dimension will perform less efficiently than individuals with average scores.
(3) The relationship between performance and "activity" will be curvilinear.

Before these hypotheses can be subjected to empirical test, it is necessary to define the terms "performance", "active/impulsive", etc. in operational terms. The measures of performance that have been used in previous research in this area have been varied, although they have tended to be either intelligence test scores or some intellectual task that has known relationships to intelligence tests. For the purposes of this investigation selected subtests of the Wechsler Intelligence Scale for Children (Wechsler, 1949) were taken as the measure of intellectual performance. The measures of "impulsivity", etc. that have been used have been much more varied, the only common factor between them being that they have an apparent semantic similarity. This would seem to be a satisfactory state of affairs in that as each new measure is shown to bear the same (or different) relationship to performance for each sex, then the network of variables that appear to have some psychological similarity (or dissimilarity) becomes apparent. Two measures of "impulsivity/activity" were used in this study, and they are fully described in the method section.

One was a measure of children's tendency to shift from one activity to another in the classroom (behavioural impulsivity), whilst the other was a measure of intellectual impulsivity, i.e. a tendency to respond rapidly in problem situation. Various investigations into intellectual impulsivity have failed to show any sex differences (Kagan *et al.*, 1964; Kagan, 1965), but it was included in this study to see what relationships it bore to the "behavioural impulsivity" measure that was employed.

The three hypotheses stated earlier were thus examined in relation to the two "impulsivity" measures employed, and the relations between "intellectual impulsivity" and "behavioural impulsivity" were examined.

METHOD

A sample of 55 boys and 50 girls was randomly taken from nine different classrooms of four schools in north-west Lancashire; the numbers of boys and girls drawn from each class were approximately equal. Additional data were available on the relations between "intellectual impulsivity", sex and I.Q. from a further sample of 24 boys and 19 girls drawn from one school in Warwickshire. The scores of the sample on the various measures used in the study are shown in Table 1.

TABLE 1. SAMPLE CHARACTERISTICS ON AGE, I.Q., BEHAVIOURAL AND INTELLECTUAL IMPULSIVITY

	Boys			Girls		
	Mean	*S.D.*	Range	Mean	*S.D.*	Range
Main sample						
I.Q.	106·2	10·02	82–129	109·9	9·97	86–132
Age	75·3	5·31	66–89	80·65	6·27	63–92
Behavioural impulsivity	2·052	0·255	1·31–2·65	1·957	0·233	1·61–2·32
Intellectual impulsivity	4·51	1·82	1–10	5·25	2·78	1–9
Warwickshire sample						
I.Q.	109·0	11·11	80–131	105·4	10·90	86–129
Age	72·10	4·29	63–84	69·70	4·69	60–81
Intellectual impulsivity	5·18	2·52	1–10	4·32	2·70	1–8

Two measures of impulsivity were taken for the main sample. The first of these, intellectual impulsivity, was developed from a test designed by Kagan *et al.* (1964). This consisted of a set of 12 groups of six pictures, one picture within each group differing slightly from the others. These instructions for administration of this test were—Say to child "I'm going to show you some pictures; one picture is a little bit different from the others. I want you to look at them carefully and then tell me which one is different". Three practice items were then given, and any wrong answers were corrected and an explanation given. Test items 1–12 were then given after first cautioning the child to look very carefully. The time to the first proferred solution was measured, and the correctness of that response recorded. The mean response latencies to items on which the child made an error were calculated and since these scores were skewed they were recast into a normal form, following the procedure outlined by Wiseman (1966). This yielded scores ranging from 0 to 10, a high score representing a low response latency. (This procedure is unlikely to have confounded age with impulsivity since the correlation between age and response latency was found to be insignificant, $r = +0{\cdot}153$). The Warwickshire sample's score of intellectual impulsivity was arrived at in precisely the same way; the scoring procedures were not combined since slightly more difficult pictures, producing rather longer response latencies, had been used.

The measure of behavioural impulsivity (activity) was derived from observation of the children in a classroom setting. Classroom behaviour was observed, using the OSCAR 2a Observation Schedule devised by Medley and Mitzel (1963), and the measure of activity was the total number of tallies in categories of child activity divided by the number of 2-min periods for which the child was observed. The categories used in the OSCAR are such that they measure gross changes of activity, like shifting from working at seat to chatting or whispering, etc. Thus this measure is more an index of a child's tendency to shift from one activity to another, than a straightforward measure of activity. It would seem, however, to be semantically related to impulsiveness as Maccoby defines it:

> "*We will use the term impulse to designate high levels of undirected activity and inability to delay or inhibit behaviour that is incompatible with goal directed activity. We assume that the ability to persist at a task involves inhibition of competing response tendencies, hence we include both 'distractability' and low task persistence as indicating lack of impulse control.*"
>
> (Maccoby, 1967, pp. 28–29).

The odd–even split-half reliability of this measure, as determined by the Pearson–Brown prophecy formula, was 0·89. Each child's score was based on sixty 2-min periods, sampled in such a way that the various classroom activities were equally represented for each child. These observations were carried out by one of the authors prior to the administration of the tests of intelligence and intellectual impulsivity. Observer reliability was assessed by two observers jointly observing three 15-min periods of classroom behaviour and recording their observations on the OSCAR. The inter-observer correlation for pupil behaviour was 0·95. Intellectual performance was measured by administering the similarities, vocabulary, block design and object assembly subtests of the WISC, these having been shown by Maxwell (1959) to be highly representative of total WISC scores.

RESULTS

Behavioural impulsivity

The first hypothesis, that boys tend to be more active and impulsive than girls, was tested by comparing the respective mean scores. On behavioural impulsivity the mean score for boys was 2·052 ($S.D. = 0{\cdot}255$) and for girls it was 1·957 ($S.D. = 0{\cdot}233$), and this difference was significant ($t = 2{\cdot}10$, df 103, $p < 0{\cdot}05$). It should be noted, however, that this difference although reliable is rather small, being less than a tenth of the range.

The second hypothesis, that children with high and low scores on behavioural impulsivity would perform less efficiently than those with intermediate scores, was examined by dividing the array of scores into three equal groups (low, intermediate and high), subdividing each group into boys and girls, and then comparing the WISC subtest scores of the six groups thus formed by means of 2 × 3 factorial analysis of variance. Since there were unequal numbers in the subgroups, a least squares analysis was used (Winter, 1962, pp. 291–3). The results of this analysis are shown in Table 2, from which it can be seen that the only significant effect was the interaction between sex and behavioural impulsivity. The nature of this interaction is shown in Fig. 2.

TABLE 2. ANALYSIS OF VARIANCE TABLE FOR WISC SCORES BY THREE LEVELS OF BEHAVIOURAL IMPULSIVITY FOR BOYS AND GIRLS

Source	Variance estimate	*df*	F	F_{95}
Sex	12·26	1		
Behavioural impulsivity	101·13	2	1·40	
Sex × B.I. interaction	227·87	2	3·14	3·12
Within groups	72·47	99		

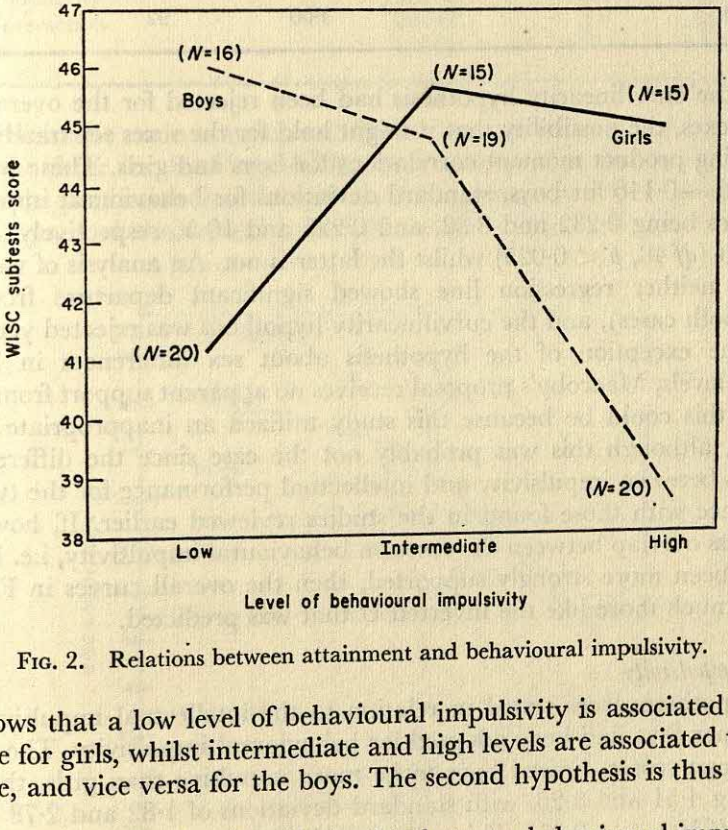

FIG. 2. Relations between attainment and behavioural impulsivity.

This shows that a low level of behavioural impulsivity is associated with lower performance for girls, whilst intermediate and high levels are associated with higher performance, and vice versa for the boys. The second hypothesis is thus rejected by these data.

The third hypothesis, that the relationship between behavioural impulsivity and performance is curvilinear, was examined by means of an analysis of variance, following the method described by McNemar (1954). This analysis provides a measure of the significance of the linear correlation between two variables, the significance of the correlation ratio, and a test of the linearity of regression, i.e. the departure of the array means from a straight line. The results of the analysis are shown in Table 3, from which it can be seen that there was no significant relationship, either linear or non-linear, between the two measures, and the third hypothesis was therefore rejected.

TABLE 3. ANALYSIS OF VARIANCE TABLE FOR REGRESSION OF BEHAVIOURAL IMPULSIVITY ON WISC SCORES

Source	Variance estimate	*df*	*F*	F_{95}
Linear regression (significance of *r*)	1·19	1		
Deviation of means from line (departure from linearity)	5·35	11	1·78	1·90
Between array means (significance of *n*)	0·26	12		
Within arrays	3·00	92		

Whilst the curvilinearity hypothesis had been rejected for the overall data, i.e. combined sexes, the possibility that it might hold for the sexes separately was tested by calculating product moment correlations for boys and girls. These were +0·474 for girls and −0·146 for boys, standard deviations for behavioural impulsivity and WISC scores being 0·232 and 8·32, and 0·225 and 10·56 respectively. The former is significant (*df* 48, $p < 0{\cdot}025$) whilst the latter is not. An analysis of variance indicated that neither regression line showed significant departure from linearity ($F < 1$ in both cases), and the curvilinearity hypothesis was rejected yet again.

With the exception of the hypothesis about sex differences in behavioural impulsivity levels, Maccoby's proposal receives no apparent support from these data. Of course, this could be because this study utilized an inappropriate measure of impulsivity, although this was probably not the case since the differently signed correlations between impulsivity and intellectual performance for the two sexes are in accordance with those found in the studies reviewed earlier. If, however, there had been less overlap between the sexes on behavioural impulsivity, i.e. had the first hypothesis been more strongly supported, then the overall curves in Fig. 2 would have been much more like the inverted U that was predicted.

Intellectual impulsivity

The hypotheses were tested in relation to the intellectual impulsivity variable in the manner that had been adopted for behavioural impulsivity. The comparison between mean scores showed boys to be more impulsive than girls, the respective means being 4·51 and 5·25, with standard deviations of 1·82 and 2·78 respectively ($t = 2{\cdot}22$, *df* 103, $p < 0{\cdot}05$). This rather small difference was not confirmed by the Warwickshire sample, boys and girls having means of 5·18 and 4·32 and standard deviations of 2·52 and 2·70 respectively. Whilst these were not significantly different ($t = 1{\cdot}06$, *df* 41, $p < 0{\cdot}10$) they were in the opposite direction to that found in the main sample.

The analysis of variance comparing groups high, intermediate and low on intellectual impulsivity for the two sexes indicated an effect attributable to level of impulsivity and no sex or interaction effects (Table 4). The mean WISC scores for boys and girls in the main sample, and for the sexes combined in the Warwickshire sample, at the three levels of impulsivity, are shown in Fig. 3. These means do not accord with the prediction that the intermediate group would be superior to the two extreme groups, and the second hypothesis must be regarded as disconfirmed by these data.

TABLE 4. ANALYSIS OF VARIANCE TABLE FOR WISC SCORES BY THREE LEVELS OF INTELLECTUAL IMPULSIVITY FOR BOYS AND GIRLS

Source	Variance estimate	*df*	*F*	F_{95}
Main sample				
Sex	8·45	1	0·09	
Intellectual impulsivity	383·11	2	4·08	3·12
Sex and I.I. interaction	122·07	2	1·30	
Within groups	93·90	99		
Warwickshire sample				
Sex	485·57	1	2·71	4·08
Intellectual impulsivity	1701·57	2	9·49	3·23
Sex and I.I. interaction	244·47	2	1·36	
Within groups	179·33	37		

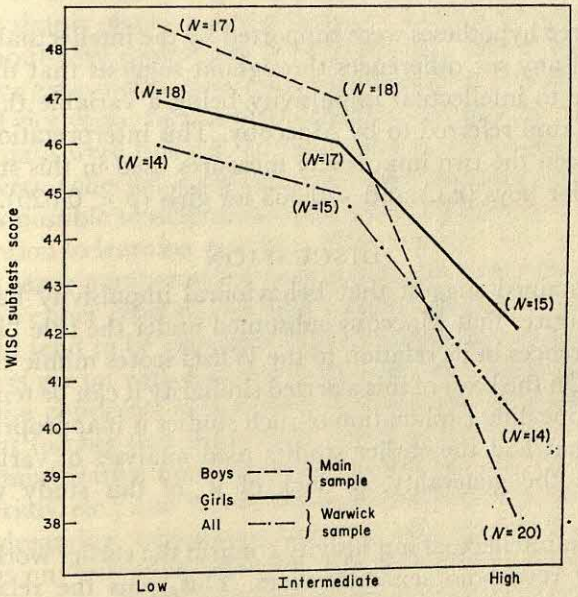

FIG. 3. Relations between attainment and intellectual impulsivity.

The curvilinearity hypothesis was again examined by calculating a product moment correlation coefficient between the two variables under consideration, and then testing for departures from linearity by an analysis of variance. The sexes combined coefficients were −0·395 and −0·411 for the main and Warwickshire samples, with standard deviations for intellectual impulsivity and the WISC scores being 2·78 and 2·52, 10·80 and 12·20 respectively. The results of the analysis of variance are shown in Table 5, from which it may be seen that the linear correlations are highly significant and that there is no evidence of a departure from linearity in either case.

TABLE 5. ANALYSIS OF VARIANCE TABLE FOR REGRESSION OF INTELLECTUAL IMPULSIVITY ON WISC SCORES

Source	Variance estimate	*df*	F	F_{95}
Main sample				
Linear regression	19·22	1	5·59	3·96
Deviation of means from line	2·31	9	0·67	2·00
Between array means	4·08	10	1·19	1.95
Within arrays	3·44	94		
Warwickshire sample				
Linear regression	18·64	1	4·60	4·14
Deviation of means from line	3·72	4	0·92	2·61
Between array means	5·31	5	1·32	2·45
Within arrays	4·03	37		

None of the three hypotheses were supported by the intellectual impulsivity data, but the absence of any sex differences throughout suggests that the lack of support might well be due to intellectual impulsivity being a variable that is unrelated to impulsivity of the kind referred to by Maccoby. This interpretation is supported by the relations between the two impulsivity measures used in this study, and correlations being 0·208 for boys (*n.s.*) and −0·363 for girls ($p < 0{\cdot}025$).

DISCUSSION

The results obtained suggest that behavioural impulsivity has some similarity to those other measures that Maccoby subsumed under the title "impulsive/active", since the sex differences in its relation to the WISC scores mimic those of the studies reviewed earlier. On the basis of this asserted similarity it can be tentatively suggested that Maccoby's appealing explanation of such studies is inappropriate. (It should be noted, perhaps, that had the earlier studies used analyses of variance, rather than correlations, then the generality, or lack of it, of this study would have been apparent.)

The findings on intellectual impulsivity confirm the earlier work of Kagan (1965) in so far as they reveal no sex differences. This, plus the relationship between behavioural and intellectual impulsivities, suggests that these are not two aspects of the same trait. In this instance it seems reasonable to assume that intellectual impulsivity is in part a cause of the lowered WISC scores, since Kagan (1965) has shown that impulsive responses interfere with performance on a variety of tasks such as reading, and serial learning. The negative correlation between intellectual impulsivity and WISC scores does not confirm several Kagan studies (Kagan *et al.*, 1964; Kagan, 1965) where generally low and insignificant relationships have been obtained between response latencies and both the California Test of Mental Maturity, and three verbal subtests of the WISC. This difference is probably explained by differences in the scoring procedures between this study and the Kagan studies. Kagan's procedure was to measure response latencies on all items, regardless of whether the child's response was correct or not. This procedure was not followed in this study because of a tendency for correct responses to be produced rapidly by all children. On the items which produced incorrect responses, however, distinct differences of approach were evident; some children responded rapidly whilst others carefully perused picture after picture. This tendency to respond rapidly on correct items by children who on difficult items took considerable amounts of time to search for a solution, suggests that the inclusion of response latencies to correct items would unnecessarily reduce the range of the average response latency scores. Further, if more intelligent children had a higher frequency of correct responses than less intelligent children (and all studies have shown that they do), then intelligent children would tend to be rated as impulsive even though their approach to problems they found difficult would show them to be reflective. Thus it appears reasonable to assume that Kagan's procedure might well have confounded intelligence and intellectual impulsivity, this in turn reducing the correlation between the two variables.

The relationship between behavioural impulsivity and intellectual impulsivity does not appear to assist in attempts to explain the impulsive/active performance relationships, but simply gives it a new dimension. Thus, if we accept that the control of intellectual impulsivity contributes to performance, then it becomes necessary to explain why active girls and inactive boys are found to be reflective (i.e. the opposite of impulsive) and vice versa. In a further attempt to identify the nexus of the problem some additional data were utilized. In the course of the major study of which this was part, data were collected about the classroom behaviour of the children, and from these it was possible to determine whether the observed effects were mediated by a lack of attention to learning activities. Thus it might be the case that the active girls enter into a large number of learning situations, whilst the passive girls spend most of their time either chatting, waiting for the teacher, etc. Active boys, on the other hand, might tend to be aggressive and to engage in physically active pursuits, whilst passive boys get on with learning tasks. The full details of the measures used in categorizing the children's behaviour is to be found elsewhere (Garner, 1971), and it is sufficient to note that three basic classifications were used, "task oriented behaviour", "administrative time" (tidying up, waiting to be seen by the teacher, passing out materials, etc.) and "non-attentive behaviour", including such activities as chatting, daydreaming, whispering, fighting, etc. An analysis of variance comparing the means on "attentive behaviour" for boys and girls classified as high or low on behavioural impulsivity was computed, and this showed an effect due to behavioural impulsivity ($F = 5{\cdot}55$, *df* 1 and 101, $p < 0{\cdot}05$), and an insignificant tendency towards a sex effect ($F = 3{\cdot}24$, *df* 1 and 101, $p < 0{\cdot}10$). There was no interaction effect ($F = 1$, *df* 1 and 101, *N.S.*). The means (expressed in percentages of the time under observation), were 61 per cent and 66 per cent for the high and low groups of boys and 65 per cent and 70 per cent for the high and low groups of girls. Whilst great care must obviously be observed in discussing these findings (e.g. Is a 5 per cent difference in attention significant educationally?; Is classroom attention significantly related to WISC performance?, etc.) they might possibly provide hypotheses for more rigorous future testing. The interesting feature of these attention time results is that they conform to the sort of pattern that Maccoby proposed for impulsivity, low and high attention times being associated with lower WISC scores than intermediate level attention, with boys making up half of the curve and girls the other. This relationship can be accounted for by asserting that low attention is related to low performance since it fails to lead to engagement in learning activities, and that high attention signifies a tendency to remain at a task beyond the point where learning has taken place, thereby reducing the number of effective learning experiences. The intermediate level is held to represent an optimal "on task" time (i.e. the same arguments that Maccoby used to support her proposals). Thus passive girls attend too much, active boys attend too little, whilst both active girls and passive boys attend for the optimal amounts. This tentative account needs to be elaborated to explain why being passive leads to over-attention for girls, yet not for boys, and why being active in boys leads to under-attention and to an optimal level of attention in girls. A plausible account can be given for these differences if it is assumed that the normative cultural expectations that are transmitted to these children are such that little girls are expected and encouraged to be rather quiet and to engage in passive pursuits, whilst little boys are encouraged to be active and to engage in more physical pursuits. In such a situation boys who conformed to the norms for boys would tend to fail to show high levels of task attention, whilst girls who conformed to the norms for girls would be extremely attentive. A "non-conformist" girl would still be influenced by expectations and would tend towards, but not reach, the behaviour levels of active boys, whilst a "non-conformist" boy would tend towards, but again not reach, the attention levels of passive girls. This suggestion is again a simple restatement of some aspects of Maccoby's argument, but which has been brought into line with the observations of this study by altering the locus of the effects from activity to attention.

The question still remains as to why activity is related to intellectual "reflection" for girls and yet to passivity for boys. A plausible suggestion can again be derived from the socialization process: passive boys tend to be those who have been encouraged to develop dependent relationships with their mothers and who have been subjected to "maternal overprotectiveness" whilst active girls are those who have been encouraged to be independent (Kagan and Moss, 1962). The unifying feature of these passive boys and active girls is that both groups have been subject to parental pressures that counter the broad cultural norms; if it is further assumed that these parental pressures indicate parental concern, and hence high levels of interaction between parent and child, and that parental contact tends to lead to the learning of reflective strategies of thinking first and acting later, etc. then the sex differences might be accounted for.

These speculations are extremely tentative, yet they do suggest the areas of study that might be profitably investigated subsequently. It is suggested, therefore, that there is a need for more study of the actual behaviour (as against the measured characteristics) of children in both the school and the home situation if an understanding of this complex area is to be achieved.

SUMMARY

Inter-relationships between subtests of the WISC, intellectual and behavioural impulsivity were examined separately for boys and girls in an attempt to confirm that impulsivity is differently related to attainment for the two sexes. It was shown that behavioural impulsivity and WISC scores were negatively correlated for boys and positively for girls, and that intellectual impulsibity was negatively related to WISC scores for both sexes. These findings are discussed in relation to Maccoby's theoretical accounts of such differences, and in relation to children's classroom behaviour. Suggestions are made for further research.

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PSYCHIATRIC DISORDER IN THE CHILDREN OF CARIBBEAN IMMIGRANTS

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INTRODUCTION

The migration of a large group of children from one culture to another involves a number of processes which have aroused controversy among workers in the field of child development. There is the effect of the parent culture on early development and learning, the effects of the social upheaval and the separation experiences during the migration, and finally there are the effects of the many facets of the new culture that the child has to cope with. These may include such things as the hostility and discrimination of the host community, or the unfamiliar educational system. In addition, stresses on the parents are likely to influence the way they raise their children.

The major difficulty in trying to disentangle the effects of these many processes in the causation of psychiatric disorder is that as every child has been subject to every process, there is no yardstick for comparison. To compare the migrants with members of the host community is not helpful either because there is no way of distinguishing between differences of a biological nature due to the different racial gene pools, or differences of a socio-cultural type. Any differences found in the pattern of psychiatric disorder between the migrant and the host community may be due as much to either of these factors as to separation experiences, or the disruption which accompanies migration. One way of overcoming this objection is to compare children who themselves have migrated and have experienced the parent culture and separation from it, with the children of immigrants who were born after their parents' migration and only know the new culture with, possibly, elements of the old culture transmitted through their parents. Both groups of children will be subject to the stresses of adaption to the new community.

An opportunity to make this type of comparison has arisen among the West Indian children attending a child guidance unit in an area with a high immigrant population. During the decade 1960–69, West Indian children attending the unit fell into two almost equal sized groups, those born in the West Indies and subsequently brought over to London, and those born in Britain.

Family life in the West Indies has been the subject of considerable study by such workers as Smith (1962), Clarke (1966) and Henriques (1953). Kerr (1952) has described child rearing practices in Jamaica. Family patterns have been found to be very heterogeneous and sensitive to economic conditions. In general, the extended family of maternal grandmother, aunt and uncle are more stable figures in the child's life than the biological father, and rates of formal marriage are low. In addition, poverty and a wide gap between rich and poor characterize these ex-

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colonial countries. Unemployment was a stimulus to migration to the United States of America and Latin America for many years before the migration to Britain developed and this added its quota to family instability.

The migration to Britain developed after World War II. The common pattern has been for the men to migrate first and to then send money for the passage of the women. Finally, often after a lapse of years, children born before the parents migrated are brought over, often to a household with a new stepfather or mother and with new younger siblings. Bell (1969) has compared the working class Negro family in Philadelphia, U.S.A. with that in Reading, England. His conclusion was that the high level of employment in Reading has prevented the disintegration of social bonds that characterizes the urban scene in the United States. Instead, the migrants have largely absorbed the cultural attitudes of the host community.

Moody and Stroud (1967), however, in studying the conditions of child rearing among immigrant families in south London, noted the cramped conditions, the widespread sharing of lavatory and kitchen facilities and the fact that mothers often had to return to work while their children were still infants. These authors believed that racial discrimination was an important factor in bringing about these poor living conditions.

Earlier studies of the problems of immigrant school children commonly contrasted West Indian with other immigrant groups where the learning of English was the main problem. However, the Inner London Education Authority study (1967) suggested that the West Indian Creole dialect is sufficiently different from standard English to handicap the child at school. It was estimated that 19 per cent of West Indian pupils at primary school had inadequate English. In addition, the language difficulty inevitably merges into another, that of educational retardation. This has been shown to be more severe among children born in the West Indies than among their fellows born in Britain by Little *et al.* (1968), who studied the school assessment profiles of 11-year-old immigrant school children in London.

A high level of disruptive behaviour in school among West Indian children is another problem that has received some comment, for example by Walker (1968). Recently this question has been systematically examined in a Schools Council project (1970). In this study, teachers were asked to complete a Bristol Social Adjustment Guide (Stott, 1958) on 220 West Indian children. There were no differences between West Indian born and English born children of West Indian parents on any of the scales which might be said to reflect disturbed behaviour.

Graham and Meadows (1967) used some of the same material as the present study in a comparison of disturbed West Indian immigrant children with a control group of disturbed English children attending the same child guidance clinic. They found roughly equal numbers of West Indian boys and girls were referred in contrast to the preponderance of boys in the rest of the clinic population. West Indian boys showed less neurotic disorder and West Indian girls more conduct disorder than the controls. The author lays emphasis on early separation experiences as being of likely aetiological importance in the disorders of the West Indian children. However, as discussed above, one could equally well postulate genetic or other environmental factors to account for any differences in their disorders as compared with a group of white children. Furthermore, Graham and Meadows (1967) did not make the crucial comparison between the West Indian and English born immigrant groups.

With the accumulation of more case material, the opportunity arises to test some alternative hypotheses.

HYPOTHESES

1. The lower boy : girl ratio among disturbed West Indian children as compared with disturbed English children found by Graham and Meadows (1967) reflects the fact that the disturbances are predominantly due to environmental rather than genetic factors. ("Environmental" here indicates the sum of socio-cultural influences on the child plus his individual life experience including the migration process. It is contrasted with "genetic" at the level of the racial gene pool as discussed in the introduction above.) This hypothesis cannot be conclusively tested with the present case material, as in the absence of a genetic analysis of the children there is no data available regarding their genetic composition beyond crude knowledge of their racial group, However, it is possible to get some guide as to whether exploration of possible environmental aetiologies is likely to be fruitful. If, in the present material, the lower boy : girl ratio is confined to the West Indian born group, then environmental factors are likely to be of importance in the aetiology of the disturbance.

2. Other prospective studies, for example Douglas *et al.* (1968), have shown that disturbance of family relationships is associated with the development of conduct disorder in boys. This leads to the following predictions in the present material.

(a) The proportion of conduct disorders, compared with other disorders, will be greater among the West Indian born boys because the disruption accompanying migration will have precipitated this disorder in a larger number of cases.

(b) As a corollary to this, those boys born in the West Indies who have migrated with their parents, rather than following them after a lapse of years (as is more usual), should show less conduct disorder than those who have been separated.

(c) Among the U.K. born boys, those who have been separated in childhood will show a higher proportion of conduct disorders.

3. Recent studies by Rutter (1970) suggest that girls are not prone to develop conduct disorders in response to family stress in the same way as boys. Generalizing this finding to cover other forms of stress, we arrive at the following predictions for the West Indian girls:

(a) The proportion of conduct disorders will be the same in the U.K. and West Indian born girls because, unlike the boys, the stress of migration is less likely to be a factor in the cause of the disorder.

(b) Those girls who have migrated with the parents will also show the same proportion of conduct disorder.

(c) Among the U.K. born girls, those who have been separated will not show the higher proportion of conduct disorders that the boys showed.

4. The excess of West Indian girls with "conduct disorder" in the material is due to a culturally determined acute reaction which has a characteristic symptom pattern and a better prognosis than conduct disorder in Caucasian children, where the prognosis has been found to be poor by Robins (1966). This hypothesis arises from the clinical impression that disturbed West Indian children form a special

group. It is postulated that the high proportion of West Indian girls in the clinic referrals is due to the numbers being inflated with this acute and comparatively benign disorder.

The hypothesis will be tested by:

(a) A short term follow-up study. Here it is postulated that the West Indian boys together with control groups of Caucasian boys and girls will show little improvement compared with the West Indian girls.

(b) A detailed analysis of the symptoms of the West Indian girls as compared with a control group of Caucasian girls. This will reveal any characteristic symptom pattern in the West Indian girls.

METHOD

The case notes study

The records of all children of West Indian parents who were between the ages of 5 and 15 at the time of their referral to the Child Guidance Unit and who were first seen in the decade January 1960–December 1969, were read and the information was transferred to punch cards. There were 204 children included in the study, 121 boys and 83 girls. The average age on referral of the boys was 8·8 yr (*S.D.* 2·4 yr) and of the girls 9·5 yr (*S.D.* 2·7 yr).

Two main problems were encountered in this procedure: (1) Important negatives were frequently missing in the notes so that it was necessary to record all information not given as positive, as negative. (2) Diagnoses were inconsistently recorded through the decade. It was therefore necessary to assign a diagnosis to each case where this was missing. Graham and Meadows (1967) found that many of the girls in their study showed a mixture of conduct disorder and neurotic symptoms. For this reason a slight modification of the triaxial classification put forward for the International Classification of Diseases by Rutter *et al.* (1969) was used. This involved the additional category "mixed disorder" proposed by Rutter (1965) to describe those children who exhibited both neurotic and anti-social behaviour and where neither predominated. The fact that the diagnosis of each child was made with knowledge of other important variables such as background experience, made it necessary to check the reliability of the diagnoses. The method used is described later.

The follow-up study

This involved all those children in the case notes study who were diagnosed as conduct or mixed disorder, who were born between 1955 and 1958 (inclusive), and who had attended the Unit before June 1968. These children were traced through the Inner London Authority care committees which form a liaison between the Child Guidance Unit and the schools in the area. The class teachers were asked to complete a questionnaire of known reliability (Rutter, 1967) concerning the behaviour of the children in the class room. As the follow-up was in March 1970, there was a minimum of 21 months in the follow-up period.

A control group of white children, all of parents born in the United Kingdom, was selected at random from the Unit population after matching for sex, diagnosis and the same four years of birth as the study children. For each of these children the case notes were abstracted and a questionnaire was sent to the class teacher in the same way as was done for the study children.

There was a total of 34 boys and 20 girls with West Indian parents and their mean ages at referral were 8·7 yr (*S.D.* 1·7 yr) and 8·6 yr (*S.D.* 2·3 yr). These were compared with 31 boys and 16 girls with English parents whose mean ages were 8·7 yr (*S.D.* 1·6 yr) and 8·3 yr (*S.D.* 2·2 yr).

The individual symptom study

To test hypothesis 5, each of the West Indian born girls with conduct disorder were matched for age, and diagnosis with an English girl drawn from the same population. Data from the notes of the English girls were coded in the same way as for the West Indian girls. The mean ages were 10·5 yr (*S.D.* 2·3 yr) for the West Indian girls and 10·5 yr) (*S.D.* 2·1 yr) for the English girls.

FINDINGS

Referrals

The majority of the referrals came through the local education authority. Among the U.K. born this accounted for 60 of the 93 children and among the West Indian born for 75 of the 111 children. The remainder were mostly referred through the local school health service at the parents' request, with a few cases referred by the General Practitioner, the probation service and the local authority children's department.

The annual rate of referrals increased steadily throughout the decade from a total of 4 in 1960, to 42 in 1969. Although no figures are available for the earlier years of the decade, this increase probably reflects an increase in the base population.

The West Indian born children tended to be born in earlier years than the U.K. born and, on average, were somewhat older at the time of referral. This made it necessary to control for age to some extent by dividing the population into older and younger groups. Of the West Indian born children, 83 were Jamaican and the remaining 28 were born in a wide variety of the smaller islands or in Guyana. This finding is consistent with the fact that the area of London in which the children lived was predominantly Jamaican in composition.

The sex ratio of the referrals for the two groups of origin and also with the total referrals to the Unit in 1967, minus the study children, are compared in Table 1.

TABLE 1. SEX OF U.K. AND WEST INDIAN BORN GROUPS AND OF TOTAL CLINIC REFERRALS FOR 1967 EXCLUDING STUDY CHILDREN

	Boys	Girls	Total
U.K. born	63	30	93
West Indian born	58	53	111
Total referrals during 1967 excluding study children	119	43	162

U.K. vs. West Indian born $\chi^2 = 5{\cdot}031$ $df = 1$, $p < 0{\cdot}05$.
West Indian born vs. 1967 referrals $\chi^2 = 12{\cdot}9$, $df = 1$, $p < 0{\cdot}001$.
U.K. born vs. 1967 referrals $\chi^2 = 0{\cdot}9$ N.S.

The data in Table 1 shows that among the West Indian born, the boy : girl ratio of referral to the Child Guidance Unit is much lower than among English born children of West Indian parents where the ratio approximates to that of English children. This finding provides some support for hypothesis 1, that the smaller boy : girl ratio of referral in the children of West Indian immigrants is probably due more to environmental rather than genetic factors.

Diagnosis

At this point in the study, the material was divided into groups according to sex, and also into older and younger age groups. The distribution of diagnoses in the four groups is indicated in Tables 2 and 3.

TABLE 2. DIAGNOSES OF WEST INDIAN CHILDREN UNDER 10 BY PLACE OF BIRTH

	U.K. born			West Indian born		
	Boys	Girls	Total	Boys	Girls	Total
No diagnosis	2	0	2	0	2	2
Developmental disorder	8	1	9	1	0	1
Conduct disorder	27	11	38	14	7	21
Neurotic disorder	9	6	15	1	1	2
Psychosis	3	1	4	1	0	1
Mixed disorder	7	3	10	7	7	14
Other (hyperkinetic syndrome)	1	0	1	0	0	0
Totals	57	22	79	24	17	41

TABLE 3. DIAGNOSES OF WEST INDIAN CHILDREN OVER 10 BY PLACE OF BIRTH

	U.K. born			West Indian born		
	Boys	Girls	Total	Boys	Girls	Total
No diagnosis	0	0	0	0	3	3
Developmental disorder	2	0	2	3	0	3
Conduct disorder	4	3	7	30	24	54
Neurotic disorder	0	4	4	0	2	2
Mixed disorder	0	1	1	1	7	8
Totals	6	8	14	34	36	70

It will be noticed that whereas in the younger groups there are a fair proportion of both U.K. and West Indian born children, among the two older groups there are very few U.K. born children. This probably reflects the fact that there are, as yet, relatively few U.K. born children of this age group in the population at large.

Previous studies such as Robins (1966) have suggested that anti-social behaviour in childhood, with or without neurotic symptoms, constitutes a syndrome with a poor prognosis. For the purposes of testing hypotheses 2a and 3a therefore, the frequencies of conduct and mixed disorders combined were compared with the frequencies of other diagnoses. The results are presented in Table 4.

TABLE 4. COMPARISON OF COMBINED FREQUENCIES OF CONDUCT AND MIXED DISORDERS WITH FREQUENCY OF OTHER DIAGNOSES

Group	Conduct and mixed disorder more frequent in:	χ^2	Significance
Boys under 10	West Indian born	4·06	$p < 0{\cdot}05$
Girls under 10	West Indian born	3·93	$p < 0{\cdot}05$
Boys over 10	West Indian born	1·00	*N.S.*
Girls over 10	West Indian born	6·74	$p < 0{\cdot}01$

Thus in all groups, the proportion of conduct disorders and mixed disorders combined is greater among the West Indian born children. In particular, it is noteworthy that the excess of conduct disorder among the West Indian born occurs in the girls as well as the boys. Thus hypothesis 2a is confirmed while hypothesis 3a is contradicted by the evidence of this study.

Another possible explanation for the data of Table 4 is that selection factors have operated in the migration process itself. It may be that relatives in the West Indies are more ready to send children with conduct disorders to rejoin their parents in the U.K. than normal children. To test this possibility, the relationship of time of arrival in the U.K. to the onset of symptoms, as reported by the parent, was recorded.

TABLE 5. RELATIONSHIP OF TIME OF ARRIVAL IN U.K. TO ONSET OF SYMPTOMS IN THE WEST INDIAN BORN CHILDREN

Symptoms preceded arrival	17
,, may have preceded arrival	14
,, within 1 month of arrival	13
,, between 1 and 6 months of arrival	9
,, between 6 months and 1 yr of arrival	7
,, 1 yr + of arrival	35
Not known + no diagnosis	16
Total	111

Table 5 suggests the possibility that as many as 31 of the 111 West Indian born children were disturbed at the time of arrival in Britain. At first sight this introduces a serious weakness into the study. There are however, two considerations which make this objection less serious than might at first be supposed. First, as the average age of arrival in the U.K. of the sample is 7·7 yr (*S.D.* 2·7 yr) we might expect some of the children to be already disturbed even if there were no selection factor operating in the migration. Secondly there is no significant difference in the boy : girl ratio between those children who were disturbed prior to arrival in Britain and those who became disturbed following arrival. Thus the sex ratio, which forms an important part of the present argument, is not affected by this possible selection factor.

Hypotheses 2b and 3b were tested by comparing those among the West Indian born children who migrated with their parents against those who were separated during migration. Only 12 children in all migrated with their parents so that, as the issue was an important one, 4 cases were added following an exhaustive search of the records of a neighbouring clinic. Of the total of 16, there were 4 boys and 12 girls. The number of boys was too small to draw any conclusions. Of the girls, 8 were diagnosed conduct disorder, 3 mixed disorder and 1 as no abnormality. It seems, therefore, that although conduct disorder is more common among West Indian born girls, this is not specifically related to the fact that they have been separated from their parents during the migration process because it also occurs in those who have not been separated.

Of the children who were separated from their parents during migration, about half were separated from mother before the age of three and half migrated themselves before the age of six. As younger children are believed to be more vulnerable to separation experiences, diagnosis was compared with age of separation and age of migration to see if there was any correlation between early separation and conduct disorder. There was no significant association in either sex.

Separations

Separations were not, of course, confined to the West Indian born group. The U.K. born children had undergone separation experiences as any other child might. To test whether there was any association between separations and conduct disorder in the U.K. born children (see hypotheses 2c and 3c), those children who had been separated for a month or more, whether in an institution, foster home or with relatives outside the home, were compared with those separated for under a month. This dividing line was chosen as a convenient index which was regularly recorded in the notes and which might reasonably be expected to reflect a greater or lesser amount of disruption in childhood.

TABLE 6. FREQUENCY OF SEPARATION OF OVER 1 MONTH AMONG VARIOUS DIAGNOSTIC GROUPS IN THE U.K. BORN CHILDREN

	Boys		Girls	
	Other diagnoses	Conduct and mixed	Other diagnoses	Conduct and mixed
Separation	6	19	5	10
No separation	17	19	7	8
Totals	23	38	12	18

For boys $\chi^2 = 3{\cdot}3$, $df = 1$, *N.S.*
For girls $\chi^2 = 0{\cdot}02$ $df = 1$, *N.S.*

Table 6 shows that although the association between conduct disorder and separation did not reach significance in either boys or girls, in boys the trend in the direction of separations being more common among those with conduct disorder is quite strong. This association is in agreement with other studies, such as that of Douglas *et al.* (1968). Hypotheses 3c and 2c therefore receive some weak support from the present data.

Follow up

The response rates and the average period of follow-up are shown in Table 7.

TABLE 7. COMPARISON OF SEVERITY OF CONDUCT AND MIXED DISORDERS IN ENGLISH AND WEST INDIAN CHILDREN AT REFERRAL AND AT FOLLOW-UP

	Length of follow-up	% success of follow-up response	At referral Mild	At referral Severe	At referral Total	At follow-up Mild	At follow-up Severe	At follow-up Total
Girls								
English	4·4	81	4	12	16	6	7	13
West Indian	4·9	90	8	12	20	12	6	18
Boys								
English	3·9	93	13	18	31	13	16	29
West Indian	3·7	85	19	15	34	9	20	29

χ^2 test showed that the differences English vs. West Indian were non-significant in all 4 groups.

The West Indian children who had lapsed at follow-up included 2 girls and 3 boys who had returned to the West Indies. The differences in length of follow-up between cases and controls were not significant in girls or boys.

The severity of the disorders in each of the groups was assessed by summating the number of areas of disturbance for each child, the method used by Rutter (1966). A child was rated as having a mild disorder if it had less than 10 symptoms at referral, or less than 9 symptoms at follow-up. A symptom count above this level was rated as a severe disorder. It should be noted that the score at referral and at follow-up are not comparable as they were collected in different ways. A comparison of the various groups is made in Table 7.

Although Table 7 shows a higher proportion of West Indian girls in the mild group at follow-up than either the West Indian boys or the control children, this does not reach statistical significance. Hypothesis 4a, that in West Indian girls conduct disorder carries a better prognosis than in other groups, is therefore not supported by the present evidence.

Individual symptoms in the West Indian born girls

The West Indian born girls were compared with an English control group, selected as described above. The object was to test hypothesis 4b that there might be a characteristic and distinct symptom pattern among the West Indian born girls.

The two groups were compared for a range of symptoms, i.e. tics, clumsiness, restlessness and poor concentration, disturbance of eating, disturbance of sleeping, abdominal pains, encopresis, enuresis, morbid anxiety, depression, situational phobias, ruminations and obsessions, school phobias, hypochondriasis, temper tantrums, stealing, disobedience, destructiveness, fire setting, truancy, running away from home, sexual misbehaviour, aggression and violent assault. In no case was there a significant difference of the frequency of a symptom between the 45 West Indian girls and the 45 English controls.

The two groups were then compared for the severity of their disorder. This was done by adding the total number of the above areas of disturbance for each child (Rutter, 1966). The mean frequency of areas of disturbance was 10·2 (*S.D.* 4·8) for the English girls and 10·5 (*S.D.* 4·2) for the West Indian girls. These differences are not significant.

POSSIBLE FACTORS AFFECTING SAMPLE SELECTION

There are various ways in which the above results might be explained. An important preliminary is to exclude the possibility that the differences found between the various groups are merely due to artifacts arising out of the way the samples used in the study were collected. To give an example, the high rate of conduct disorders among the West Indian born children may be associated with subcultural factors, perhaps a lower social status in this group. Similarly, the excess of girls in the West Indian group may merely reflect an excess of girls in this group in the population at large and have nothing to do with emotional disturbance at all.

Comparison of the social status of the U.K. and West Indian born immigrant children

Current family composition, social class, whether or not the mother worked and details of accommodation were noted. The types of family composition were classified according to whether both parents were together in the home, whether a parent and step-parent were bringing up the children or whether the mother was bringing up the children alone. These categories were thought to best reflect the various situations resulting from the effect of migration on West Indian family structure, as described by Fitzherbert (1967). Social class was classified according to the Registrar General's Classification of Occupations (General Register Office, 1966).

Family structure differed significantly according to the place of birth of the child. Households with mother alone were more common among the U.K. born group and children living with mother and stepfather or father and stepmother were more common among the West Indian born children.

In both groups over a third of the mothers worked full time. This may reflect a more serious situation among the U.K. born as the children were, on average, younger in this group. In this connection it is interesting that the ages of the mothers did not differ significantly in the two groups.

Social class was approximately evenly distributed between III (manual) and V with a few cases of social class IV in both the U.K. and West Indian born groups. Nearly 2/5ths of the children were living in overcrowded accommodation (more than 1·5 persons per room). There was a trend for the U.K. born children to be more often in overcrowded accommodation and also for children with conduct disorders to be more often in overcrowded accommodation. However, neither of these trends achieved statistical significance.

Parental psychiatric and children's physical illness

Any report of the parent being admitted to psychiatric hospital was noted. Twenty of the current mothers or mother substitutes had been under the care of a psychiatrist, either as an inpatient or an outpatient at some time. They were equally proportioned among the U.K. and West Indian born children but it is noteworthy that they constituted 1/10th of the study population. Only three fathers had been under psychiatric care, but they may have been under-reported.

Physical illnesses in the children were noted and there are many ways in which they may have been important (e.g. inferior obstetric care in the West Indies could have led to more brain damage which, in turn, could account for the excess of conduct disorder in that group).

There was one U.K. born brain-damaged boy with hyperkinetic syndrome and one West Indian boy with conduct disorder and suspected temporal lobe epilepsy. There was also one U.K. born boy who was neurotic, had had a fit, and had an abnormal E.E.G. One U.K. born boy had an abnormal gait of undetermined origin and there was a West Indian born boy with conduct disorder who was blind in one eye. There were seven children with asthma and/or eczema and one of these, a girl, also had pyelitis.

The base population

Statistics were obtained from the local Education Authority of the numbers of West Indian children (irrespective of place of birth) attending the various schools in the area served by the Unit in May 1968. Taking the increasing number of referrals over the decade into account, this date came close to the median date of referral for the children.

Pooling primary and secondary schools, the ratio of boys : girls was 3178 : 3444. If taken into account, this ratio would tend to reduce the significant differences in the sex ratio of referrals to the unit shown in Table 1. The question is, can this factor account for the whole of the differences in referral? Unfortunately, U.K. and West Indian born children were not distinguished in the local authority figures.

If we assume that there is no real difference in sex ratio of referral between the U.K. and West Indian born groups, we can then pool their numbers and correct for the population sex ratio. We can then compare this corrected figure for the West Indian referrals with the total referrals for 1967 as shown in Table 1. If this is done, the sex ratio difference between the groups is still significant ($\chi^2 = 5{\cdot}98$, $df = 1$ $p < 0{\cdot}02$). Hence it seems most unlikely that the differences in sex ratios are an artifact.

RELIABILITY STUDY

The basic technique of this study has been to compare sets of variables for evidence of association and so to build up a picture of the genesis of conduct disorders in West Indian children. However, as all the data was collected by one individual, there remains the possibility that judgements were biased unconsciously in a manner that would tend to confirm the various hypotheses put forward.

The two central variables in the study were diagnosis on the one hand and whether the child was born in the West Indies or the U.K. on the other. It was therefore decided that two independent assessors should be asked to give a diagnosis and rate symptomatology while in ignorance of the child's background history. The assessors' rating would thus have no chance of being contaminated by this other important variable, of whether the child was born in the West Indies or the U.K.

Method

Important parts of the records of a sample of 47 of the study children were duplicated and information about their immigration experiences were erased from the duplicated copies. The sample of the study children was selected as follows:

(1) The total sample was divided into U.K. and West Indian born groups.
(2) Each of these groups was divided into diagnostic subgroups.
(3) A small sample from each subgroup was taken and all these samples were then put together. The result was thus a stratified sample of the clinic population.

The two assessors were then asked to make a diagnosis on each case in this sample.

In addition, for 10 of the cases, the assessors were asked to complete a check list of individual symptoms.

Results

Both assessors agreed with the investigator on 30 diagnoses and disagreed on 17 diagnoses. In addition, the two assessors agreed with each other on 30 diagnoses and disagreed on 17.

The main dichotomy used in this study has been between conduct and mixed disorder vs. other diagnoses. It is therefore important that the variable of place of birth is not associated with the variable of conduct and mixed disorder vs. other diagnoses.

The assessments of the two independent assessors varied from those of the investigator in this respect as follows:

Assessor I

Cases diagnosed non-conduct disorder who were diagnosed conduct disorder by the investigator:

U.K. born = 2
West Indian born = 2

Cases diagnosed conduct disorder who were diagnosed non-conduct disorder by the investigator:

U.K. born = 0
West Indian born = 1

Assessor II

Cases diagnosed non-conduct disorder who were diagnosed conduct disorder by the investigator:

U.K. born = 4
West Indian born = 2

Cases diagnosed conduct disorder who were diagnosed non-conduct disorder by the investigator:

U.K. born = 0
West Indian born = 1

Thus overall, there was a slight tendency for the investigator to have overdiagnosed non-conduct disorders in the West Indian born and conduct disorders in the U.K. born. From this evidence, the differences shown in the investigation would have been even greater had the material been re-diagnosed by either of the assessors.

Symptom reliability

Although agreement on the two broad categories is good, we cannot be satisfied where the three assessors disagree on more than a third of the diagnosis. The next question is whether they have based their diagnoses on different evidence culled from the notes, or whether they have recorded the same symptoms but merely used different diagnostic criteria in their diagnostic classification. If the former were true it would represent a more serious defect in the study, because it would show that not only was the information in the records of unknown unreliability, but that the process of collecting it was unreliable.

In the ten cases where an item sheet for symptoms had been completed, the number of neurotic and the number of conduct symptoms were summated and the figures for each case compared between assessors. In this way the correlations between the scores on the ten cases by the three assessors were calculated, and are shown in Table 8.

TABLE 8. INTERCORRELATIONS OF SYMPTOM SCORES GIVEN BY THE 3 ASSESSORS ON 10 CASES IN VARIED DIAGNOSTIC CATEGORIES

	Conduct symptoms			Neurotic symptoms		
	Invest.	Ass.I.	Ass. II.	Invest.	Ass. I.	Ass. II.
Investigator	—			—		
Assessor I	0·7545	—		0·8064	—	
Assessor II	0·7424	0·7353	—	0·3460	0·0062	

Thus 'Neurotic symptoms' between the Investigator and Assessor II is the only case where there is not a satisfactory level of correlation. However, as Assessor I and Assessor II only correlate 0·006 on neurotic symptoms, Assessor II appears to be the more deviant of the three.

DISCUSSION

As hypothesis 1 has been supported by the evidence of the present study, it seems more fruitful to postulate environmental rather than genetic hypotheses to account for the differences in the pattern of psychiatric disorder in West Indian children when compared with English children (Graham and Meadows, 1967). The main issue arising in Graham and Meadows' paper was the relatively higher proportion of conduct disorders in the West Indian children of both sexes. The sexes are handled separately in the present study because there is evidence that there may be differences in the aetiology of conduct disorder in the two sexes (Rutter, 1970).

In boys the consistent finding in the present study is for conduct disorder to be associated with disturbed early upbringing, whether this is due to separations in childhood in the U.K. born or to migration experiences in the West Indian born. As stated above, this finding is not new.

In the girls, however, the situation is less straightforward. Hypothesis 3a, that the proportion of conduct disorders in the U.K. and West Indian born will be the same, is flatly contradicted by the finding of a higher proportion of conduct disorders in the West Indian born girls. Two strands of evidence suggest, however, that this higher incidence is not due to the disruption involved in the migration process. First, the girls who migrated with a parent and therefore might be thought to have a less disrupted childhood, all had conduct or mixed disorders. Second, U.K. born girls who had had extensive separation experience did not show the same excess of conduct disorders as did the boys.

The symptoms of the conduct disordered girls cannot be explained away by postulating that they signify a relatively benign disorder, for at follow-up they did not fare significantly better than English girls with conduct disorder. Similarly, the symptom patterns of the West Indian girls and the English girls were indistinguishable.

The picture that emerges from the study of these West Indian girls therefore seems to point to a different aetiological factor to conduct disorder which may have been overshadowed in studies of boys by the persistent finding of the association of disturbed early upbringing.

Apart from the migration experience itself, the West Indian born girls differ from the U.K. born in having been exposed to the West Indian culture during their early years. Perhaps it is the learning experience of this culture in the early years which predisposes the girls, when later moved to an urban British environment, to break down with conduct disorders, rather than other types of disturbance, in response to the stresses of growing up in difficult conditions.

SUMMARY

The notes of 204 children of Caribbean immigrants attending a Child Guidance Unit were examined. Those children born in the West Indies were compared with those born in Britain. In addition, a short term follow-up study was carried out.

A high proportion of disturbed girls and of girls with conduct disorders was found among the West Indian born children.

The evidence suggests that, unlike the boys, conduct disorder in the girls is not associated with the disturbance of migration. The possible aetiology of the disorder is discussed.

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THE RELIABILITY OF RATING SCALES FOR ASSESSING THE BEHAVIOUR OF DISTURBED CHILDREN IN A RESIDENTIAL UNIT

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INTRODUCTION

IN DRUG TRIALS with disturbed children in residential care there is a need for carefully prepared rating scales of known reliability. These should be short enough for nurses to complete without fatigue and should cover as wide as possible an area of behaviour with a small number of items. In a trial of haloperidol carried out in a children's psychiatric in-patient unit (Cunningham, Pillai and Rogers, 1968) rating scales were used, based on behaviour items extracted from an analysis of the nurses' notes. These scales covered a wide range of types of behaviour which nurses readily notice, but they had a number of defects. They were insufficiently accurate (being unipolar 3-point scales), the degrees were not defined, they were likely to be subject to halo effect and their reliability appeared to be low. Accounts of other trials with children in residential care (Eisenberg *et al.*, 1963; Connors and Eisenberg, 1963), suggested that the rating scales used in these studies may have had similar drawbacks. The aim of the present study was to find the reliability of a number of behaviour items and to select from them a few which could be assessed reliably and which would cover an adequate range of types of behaviour.

Pritchard (1963) studied the reliability of nurses' ratings of children in a psychiatric in-patient unit. In his study two nurses assessed 18 children on four occasions. The observations covered a period of four weeks and assessments were made at the end of each week. Fourteen behaviour items were used, most of which were assessed on bipolar 7-point rating scales. It was found that the correlations between raters varied from 0·81 for "quantity of speech" down to 0·37 for "manifest anxiety" and 0·30 for "feeding". Inter-rater correlations were found to improve if the ratings from successive weeks were combined. For example, the correlation between raters on manifest anxiety was only 0·37 if one week's ratings were considered, but rose to 0·58 if two weeks' ratings were combined and to 0·75 for the sum of four weeks' ratings. As the children's behaviour must have fluctuated and the nurses observed them at different times, the combination of successive ratings probably tended to smooth out random variations and this produced higher inter-rater agreement. It was also found that combining the assessments of the two nurses increased the rate-rerate reliabilities. Thus the study suggested that adequate reliability could be obtained from nurses' ratings by combining several weekly assessments and that it might be still further improved by combining results from different nurses.

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In a drug trial it is important to assess other aspects of behaviour in addition to those which the drug is expected to affect. For instance, a certain drug might be expected to damp down over-activity but it could affect other aspects of behaviour in a less beneficial way. For example, it might make the children sleepy or miserable. It might, on the other hand, have some unexpected beneficial effect. For these reasons it is important to assess as wide an area of behaviour as possible. But the time and patience of nurses are limited. Too long a list of items to be rated would defeat its own ends, by making the rater fatigued and therefore careless. The problem, therefore, arises of covering the widest possible area of behaviour with the shortest possible list of traits. Factor analytic studies of problem behaviour in children are relevant to this question of coverage. It is possible to economize on the number of traits to be assessed by including only one or two representatives of any cluster of highly correlated traits and as many representatives of independent factors as possible.

TABLE 1. CLUSTERS OR FACTORS FOUND IN 3 RESEARCHES ON PROBLEM BEHAVIOUR IN CHILDREN

Jenkins (1946–1966) (cluster analysis)	Collins, Maxwell and Cameron (1962) (factor analysis)		Phillips (1968) (factor analysis)
500 Child guidance cases (about 9–15 yr)	268 boys 98 girls 8–10 yr Child guidance cases		600 "Normal children" in the fourth grade behaviour-item sheets filled in by teachers
	Boys	Girls	
Undomesticated group (negativism, defiance of authority tempers)	1 Rebelliousness	1 Rebelliousness and rootlessness	1 Aggression with independence strivings. (Quarrelsome, bullying, resentful, temper tantrums)
Over-anxious neurotic group	3 Anxiety factor	3 Anxiety factor	3 Emotional disturbance with depression
Hyperactive group			5 Diffuse hyperactivity
Shy-seclusive group			2 Active withdrawal
Socialized delinquent group			
	2 Rootlessness vs. cossetedness		
		2 Timid school failure	
			4 Self-enhancement through derogation of others

Table 1 shows the results of three researches on problem behaviour in children. Jenkins (1946, 1966) used cluster analysis and Collier, Maxwell and Cameron (1962) factor analysis on Child Guidance cases, while Phillips (1968) factor analysed items of "problem" behaviour shown among normal children. Factors or clusters which appear similar have been arranged in horizontal rows in the table. All three studies appear to have found a group of symptoms which could be described as aggressive rebelliousness. Two studies found a group of anxiety symptoms, while the third found a factor of emotional disturbance with depression. Two studies found that items indicating hyperactivity were correlated and two found that symptoms of shyness, seclusiveness or withdrawal tended to go together. Taking into account the main results of these studies it would seem desirable that a set of rating scales used in a drug trial should cover the four areas of aggressive rebelliousness, hyperactivity, anxiety and withdrawal.

There is, however, one difficulty here. One cannot assume that traits which are highly correlated among a group of individuals will necessarily change together when the mood of an individual changes, or when he is influenced by a drug. Cattell states (1960) that "it is at least theoretically possible that the set of variables which change together when a person moves in and out of an anxious state are in some way different from the set of measures which change together when we compare anxious with non-anxious people". However, it seems more likely that traits which are highly correlated, for example, quarrelsomeness and bad temper would change together under the influence of a drug than traits which are uncorrelated, for example, anxiety and activity. Therefore, if we have to limit the number of traits assessed, in the absence of knowledge of which traits tend to change together, it seems reasonable to pick traits from several uncorrelated factors in order to produce the best coverage of possible changes.

METHOD

In this study the subjects were all the 19 children resident in one ward of Ladyfield, a psychiatric in-patient unit. Their ages ranged from 7½ to 14½ yr and they exhibited a variety of disturbances of behaviour. They included neurotic disorders, reactive behaviour disturbances and hyperkinesis. There was one case of a speaking child with a language difficulty. Five of the children might have been described as psychotic. One of these was a non-speaking case of infantile autism. Another was a schizophrenic child. The other three showed psychoses of a less clear-cut nature. Each of the ten nurses working in the ward was asked to assess the children on a list of 24 traits (Table 2). Eighteen of these traits came from a previous (unpublished) study of the nurses' notes and represented types of behaviour on which the nurses frequently commented.

Six traits were added which had not been included in the nurses' notes. The traits of activity, alertness and talkativeness were added as variables likely to be affected by drugs. "Seeking the attention of other children" was included as it was a common and obvious feature of the behaviour of some children in the unit. "Ability to learn from experience" and "facing facts" were added after discussion with the psychiatrist in charge of the unit as they were felt to have an important relation to a child's progress.

No attempt was made, at this stage, to select traits according to factorial "areas" to be covered. It was intended to make this selection afterwards when the results on reliability and the intercorrelations between traits had been obtained.

TABLE 2

Trait	Definitions of the five degrees of each trait				
Activity	Never still for a moment	On the go most of the time	Normally active	Less activity than average	Very little spontaneous activity
Capacity sustained effort	Sustains activity for very long time	Sustains activity for longer than most children	Settles to one thing for normal length of time	Seldom settles to one thing for long	Constantly flits from one thing to another
Teasing	Constantly teases other children	Frequently teases other children	Sometimes teases in a good-natured way	Seldom teases other children	Never teases other children
Bullying	Constantly bullies or attacks other children	Inclined to bully or attack other children	Occasionally bullies or attacks children	Does not attack other children unless provoked	Never attacks other children
Alertness	Extremely alert and wide awake	Very alert	Normally alert	Sleepy at times during the day	Very sleepy for most of the day
Obedience	Always does as he is told immediately	Does as he is told more readily than most children	Usually does as he is told but may grumble	Inclined to resist doing as he is told	Extremely disobedient
Physical aggression with adults	Sometimes attacks adults viciously	Sometimes attacks adults when frustrated or to gain attention	Sometimes attacks adults in a mild or playful way	Seldom attacks adults even playfully	Never attacks an adult
Verbal aggression to adults	Often abuses or swears at adults	Sometimes abuses or swears at adults	Occasionally abuses an adult	Seldom abuses an adult	Never abuses an adult
Happiness	Exceptionally happy	Happy most of the time	Normal degree of happiness	Rather unhappy at times	Very unhappy
Destructiveness	Very often destroys or damages things	Inclined to destroy or damage if in a temper	Occasionally does a little damage if in a temper	Very seldom destroys or damages things	Never destroys or damages things
Playing with other children	Plays extremely well with others	Plays well with others	Plays fairly well with others—sometimes drops out of game	Does not play much with others—soon drops out	Very seldom or never plays with others

TABLE 2 (cont.)

Trait	Definitions of the five degrees of each trait				
Resentfulness	Often extremely resentful	Can be quite resentful at times	Mildly resentful if reprimanded or punished	Scarcely ever shows resentment	Never shows resentment
Anger	Often has violent tempers	Quite liable to lose his temper	Normally loses temper only occasionally	Very seldom loses his temper	Never loses his temper
Talkativeness	Practically never stops talking	Very talkative	Sometimes talkative, sometimes quiet	Talks less than average	Seldom or never talks
Fear	Extremely fearful	Rather fearful	Some mild fears, but not many	Has less fear than most children	Has practically no fear
Seeking adult attention	Constantly demands adult attention	Often demands adult attention	Seeks adult attention to a normal extent	Seldom seeks adult attention	Never seeks adult attention
Facing facts	Can talk quite honestly about facts which are unpleasant for him	Does not deny facts which are unpleasant for him, but not keen to talk about them	Sometimes denies facts which are unpleasant for him, but can face them with help	Often denies or glosses over unpleasant facts	Constantly romances or takes refuge in fantasy
Ability to learn from experience	Learns exceptionally quickly how to behave	Learns very quickly what he should do	Normal response to correction or experience	Takes a long time to learn by experience	Correction or bitter experience make no difference to his behaviour
Quarrelsomeness	Constantly in fights or quarrels	Frequently in fights or quarrels	Occasionally in a fight or quarrels	Seldom has a fight or quarrel	Never has a fight or quarrel
Irritability	Extremely irritable	Rather irritable	Only irritated by something really annoying	Puts up with a good deal without getting irritated	Exceptionally tolerant, never gets irritated

TABLE 2 (cont.)

Trait	Description of the five degrees of each trait				
Seeking attention of other children	Always seeks attention of children by provoking, bragging, showing off or currying favour	Often tries to get attention of other children	Normal need for recognition by other children	Does not care whether other children notice him	Prefers not to be noticed
Independence	Never seeks adult help	Seldom seeks adult help	Seeks adult help to normal degree	Often seeks adult help or support	Constantly seeks adult help or support
Affection (kisses, hugs, sitting on knee, etc.)	Extremely affectionate (may be embarrassing)	Very affectionate	Normally affectionate for age	Seldom affectionate to anyone	Never affectionate to anyone
Anxiety	Extremely anxious	Rather anxious	Normal	Less worried or anxious than average	Never at all worried or anxious

Each trait was rated on a bipolar five-point scale. The degrees of each scale were defined and care was taken to make these definitions as clear and unambiguous as possible. In some cases frequency and intensity were combined in the scales as in the case of resentfulness, anger and fear. This might have produced some ambiguity in traits. Later discussion with the raters showed that they did not find this type of ambiguity a source of difficulty. However, it is possible that the correlations might have been slightly improved if these traits had been made unidimensional. For example the trait of anger might have been better defined purely in terms of frequency of tempers, without any reference to their violence.

A separate page of the rating scale booklet was devoted to each trait. A list of the children was given down the side of the page. Beside this were five columns headed by definitions representing the five degrees of the trait. By asking the nurses to rate all the children on one trait at a time it was hoped to avoid halo effect. Since this was not a normal sample of children no instructions were given to the nurses as to the numbers of children expected at each degree of a trait. However, it was hoped, from the way in which the traits were defined, that the distributions would be reasonably symmetrical.

The ratings were made during the last month of the school term and were based on observation of the children during the preceding 2 months. In order to avoid fatigue the rating was extended over 3 weeks, eight traits being assessed at the end of each week. The nurses all completed the same group of traits during the same weeks and the traits were in the same order for each nurse. For the following reasons it was not expected that order effects would be important. The nurses had had previous experience of using rating scales, so that practice effects were likely to be small. In view of the brevity of the task of rating eight traits, fatigue or boredom was unlikely to influence the ratings.

The nurses were instructed to base their assessments on their own observations and not to consult other nurses about them.

Statistical method

In considering the extent of agreement between raters, one may first study the degree of absolute agreement, that is, the extent to which the nurses give identical or closely spaced ratings to a given child. Secondly one may study the extent to which they agree on the *differences* between children, for example, in finding child *A* more quarrelsome than child *B*. To study absolute agreement we used the variance of the ratings of the ten nurses who rated a child on a given trait. To study agreement on the differences found between children we used the correlation coefficient, calculating the average of all the inter-correlations between pairs of nurses. These two indices do not necessarily go together. If, for instance, the nurses tend to rate all the children in the same way each child may be given closely similar ratings by all the nurses but the inter-correlations between nurses will be low as the nurses are not finding differences between the children on which to agree. On the other hand, it would be possible for nurses to have different standards of ratings from each other, but still to agree on the differences they find between the children. In that case the correlations between nurses would be high, although the number of identical ratings given to any child might be low. In drug trials it is the assessment of differences between children or between the same child's behaviour on different occasions which matters. Variation in the absolute level of rating by different nurses need not interfere with this. We have, therefore, laid emphasis on the agreement on differences, as assessed by the correlation coefficient.

For a given nurse, rating a given trait, the distribution of the ratings given to the children was often found to be skewed to one end or the other. (This was most marked in the case of "Physical aggression to adults" and "Verbal aggression to adults", both of which were skewed towards absence of the trait in question.) However, for any one trait, the distributions from most of the nurses were skewed in the same direction. They were not homoscedastic, but because of the restriction of a five-point scale, there were no extreme values which would be liable unduly to inflate or deflate any correlation. Thus although the distributions did not strictly satisfy the conditions for the use of the product-moment correlation it was felt that this statistic would give an adequate indication as to how well the nurses agreed on the relative placement of the children on the scales.

For each trait the inter-correlations between each nurse and every other nurse were computed. These correlations were converted to Fisher's z-coefficients and the mean of these translated back into a correlation.*

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*Correlations were converted to z-coefficients since product-moment correlation coefficients cannot strictly speaking be averaged as they are not values on a scale of equal metric units. Differences between large r's are actually much greater than differences between small r's. The z-coefficients methods gets over this difficulty (see Guilford, 1956, pp. 325–6).

RESULTS

For each child, assessed on each trait, the mean and variance of the ten nurses' ratings were found. Table 3, column 1, gives the mean between-raters variance, for each trait, averaged over children. This is an indicator of the extent of absolute agreement by the nurses in their ratings of the children. The second column gives the variance between the means for the various children. This indicates how the nurses spread the children out in rating them. It will be seen that some traits show good absolute agreement between nurses (low between–nurses variance) but small variance among the means for children. For these traits, although the nurses agree, the F-ratios and correlations are low because the nurses are tending to mark all the children in the same way. Examples of this are the traits of "alertness" and "happiness". Table 4 shows the distributions of nurses' ratings on alertness and shows why, in spite of good absolute agreement, the correlations are low. For all children except three the most frequent rating is in column 3.

TABLE 3. INTER-RATER VARIANCE AND CORRELATIONS FOR TRAITS

Trait	Variance between raters for each child averaged over children	Variance between the means of children	F-ratio	Average inter-correlation between nurses	Correlation of sum of five nurses with other five
Quarrelsomeness	0·38	1·81	48·04	0·86	0·98
Seeking attention of other children	0·41	1·06	25·76	0·73	0·96
Teasing	0·43	1·44	33·48	0·81	0·95
Bullying	0·63	1·45	22·88	0·75	0·95
Playing with other children	0·30	1·16	39·32	0·81	0·92
Talkativeness	0·44	0·83	19·10	0·68	0·91
Physical aggression to adults	0·87	0·53	6·11	0·40	0·76
Verbal aggression to adults	0·42	0·53	12·72	0·58	0·94
Obedience	0·79	0·88	11·09	0·62	0·84
Seeking adult attention	0·70	0·66	9·48	0·51	0·83
Independence	0·96	0·48	5·03	0·40	0·85
Affection	0·66	0·37	5·60	0·34	0·70
Resentfulness	0·68	1·13	16·53	0·71	0·86
Anger	0·44	0·83	19·10	0·68	0·82
Irritability	0·69	0·59	8·62	0·52	0·77
Fear	0·76	0·60	7·95	0·48	0·87
Anxiety	1·04	0·35	3·40	0·25	0·24
Happiness	0·34	0·22	6·41	0·40	0·84
Activity	0·37	0·86	23·58	0·72	0·97
Sustained effort	0·28	0·77	27·73	0·78	0·98
Alertness	0·26	0·11	4·40	0·39	0·62
Destructiveness	0·74	0·87	11·78	0·58	0·86
Facing facts	0·84	0·50	5·96	0·41	0·67
Learning from experience	0·40	0·42	10·56	0·54	0·88

TABLE 4. DISTRIBUTION OF RATINGS FOR "ALERTNESS" (CHILDREN RANKED IN ORDER OF MEAN RATING)

	Ratings				
Children in rank order	1	2	3	4	5
1		3	7		
2			10		
3			10		
4		1	8	1	
5		2	6	2	
6			9	1	
7			9	1	
8			9	1	
9			9	1	
10			8	2	
11			8	2	
12		1	6	3	
13			7	3	
14		1	6	2	1
15			7	2	1
16			5	3	2
17			2	8	
18			2	8	
19			2	6	2

Other traits show low between–nurses variance, but relatively large variance between the means for the various children. These are the traits on which the nurses agree on the differences they find between the children. That is, they agree in rating certain children high and others low. Examples of such traits are "quarrelsomeness", "teasing", "seeking the attention of other children", "bullying", "playing with other children", "activity", "sustained effort" and "resentfulness". For these traits the *F*-ratios are high and the intercorrelations between nurses are high. Table 5 shows the distribution of nurses' ratings on one of these traits, namely, quarrelsomeness. It shows how the nurses tended to agree in rating some children low on quarrelsomeness and others high.

Lastly, there were some traits on which the absolute agreement between nurses was poor, that is, the variance between raters was large. In these cases the between-children variance was usually small in relation to the between-raters variance and thus the *F*-ratio and the correlations were low.

Examples of such traits were "anxiety" and "independence". Table 6 shows the distribution of ratings on anxiety. It will be noted that on this trait there are wide differences between the nurses in rating individual children ranging in several cases from the lowest to the highest rating point.

The most satisfactory traits from the point of view of drug-trials are those where the nurses agree on the differences they find between children and these give high correlations. Table 3, column 4, shows that quarrelsomeness, seeking attention of other children, teasing, bullying, playing with other children, talkativeness, anger,

TABLE 5. DISTRIBUTION OF RATINGS FOR "QUARRELSOMENESS" (CHILDREN RANKED IN ORDER OF MEAN RATING)

	Ratings				
Children in rank order	1	2	3	4	5
1	10				
2	8	1	1		
3	7	2	1		
4	6	4			
5	5	5			
6	3	5	2		
7	2	5	3		
8		8	1	1	
9		4	6		
10		1	7	2	
11			3	7	
12			3	6	1
13		1	2	2	5
14				7	3
15			2	2	6
16			2	2	6
17				5	5
18				4	6
19				3	7

TABLE 6. DISTRIBUTIONS OF RATINGS FOR "ANXIETY" (CHILDREN RANKED IN ORDER OF MEAN RATING)

	Ratings				
Children in rank order	1	2	3	4	5
1	6	3		1	
2	5	2	2	1	
3	6	1	1	1	1
4	3	3	2	2	
5	2	4		4	
6	3	2	1	3	1
7	2	1	4	3	
8	1	3	3	3	
9		2	8		
10		2	8		
11		5	2	3	
12		2	7	1	
13		3	4	3	
14		1	6	3	
15		2	3	4	1
16	1	1	1	6	1
17		2	1	7	
18		1	4	3	2
19	1		1	6	2

activity, and sustained effort were all fairly satisfactory in this respect, giving average intercorrelations between raters of 0·68 or higher. The traits of happiness, alertness and learning from experience were unsatisfactory because they did not spread the children out enough and thus gave low correlations in spite of fairly good absolute agreement. Physical aggression with adults, seeking adult attention, independence, affection, fear, anxiety and facing facts gave poor agreement in both senses.

The remaining traits, namely verbal aggression to adults, obedience, resentfulness, irritability and destructiveness were only moderately satisfactory. They all gave significant *F*-ratios and correlations of 0·58 or higher, but either the variance between raters was rather large or the variance between children rather small.

Turning to assessments of individual children there were some differences between children in the reliability with which they were assessed. Table 7 shows the inter-nurse variance for each child averaged over traits. The worst assessed on average was a schizophrenic girl (child 6). The two best were reactive behaviour disorders (children 12 and 14). The psychotic children all produced more complete agreements than the other children (Table 7, column 2), but they also tended to produce more blatant disagreements. The complete agreements in the case of psychotic children were usually on the absence of such traits, as "playing with other children", "quarrelsomeness", "teasing", "bullying". That is, they were traits involving contact with other children which psychotic children seldom make. The wide dis-

TABLE 7. INTER-RATER VARIANCE FOR CHILDREN

Child	Variance between raters for each trait averaged over traits	Number of traits where all 10 raters agree
1	0·44	0
2	0·51	1
3*	0·55	3
4	0·59	0
5	0·73	0
6*	1·03	3
7	0·54	0
8	0·65	1
9	0·75	2
10	0·51	0
11*	0·71	5
12	0·37	2
13	0·40	1
14	0·37	2
15*	0·50	5
16	0·45	1
17*	0·67	6
18	0·63	1
19	0·68	1

*Psychotic children.

agreements over certain traits in psychotic children seemed to be due to a difficulty in applying the trait-descriptions to psychotic behaviour. For example, in the case of the schizophrenic girl there was wide disagreement on "physical aggression with adults", "destructiveness", "resentfulness" and "anger". This child did have aggressive outbursts, but some staff did not feel that the above descriptions fitted the girl as these outbursts seemed quite beyond her deliberate control. A non-speaking autistic child produced wide disagreement on obedience, destructiveness and affection. This child did not usually do what she was told, but some nurses felt this could not be called disobedience as she probably did not understand what she was told. Although her actions did sometimes result in damage, some nurses felt this was not deliberate and should not, therefore, be called destructiveness. With regard to affection, the child showed a desire for physical contact, but many may have felt this was not real affection. Thus, it seemed that some of the scales were more suited for assessing the behaviour of disturbed non-psychotic than psychotic children.

In cases where all ten nurses agreed it was generally on the absence of a given form of behaviour. For example, they would agree that the child did not talk at all, did not play with other children at all or never swore at adults. There were 35 instances (out of a possible 456) in which all ten nurses agreed and, of these, 26 were agreements on the complete absence of a trait. This finding is not surprising since if a trait is positively shown nurses may disagree in estimating its intensity, but if it is not shown at all there is no room for disagreement.

TABLE 8. COMPARISON OF INTER-RATER CORRELATIONS FOUND BY PRITCHARD AND CUNNINGHAM

Pritchard	Correlation between 2 nurses	Cunningham	Average correlation between 2 nurses
Speech quantity	0·81	Talkativeness	0·68
Motor activity-quantity	0·65	Activity	0·72
Predominant mood (happy or unhappy)	0·54	Happiness	0·40
Manifest anxiety	0·37	Anxiety	0·24
		Fear	0·48
Social relationship to other children	0·71	Playing with other children	0·81
Assaultive	0·75	Bullying	0·75
Anger	0·68	Anger	0·68
Social relationship with adults (seeking attention)	0·73	Seeking adult attention	0·51

In Table 8 the inter-rater correlations obtained in this study are compared with those of Pritchard, for those traits which the two studies have in common. The results show some similarity. Both studies found that such traits as as speech quantity (or talkativeness), social relationship with other children, assaulting other children, anger and motor activity can be assessed with a fair degree of reliability, whereas the assessments of predominant mood (happiness or unhappiness) and of anxiety or fear are very unreliable.

TABLE 9. CLUSTERING OF TRAITS (A TRAIT WAS PLACED IN A GROUP IF IT HAD ONE OR MORE CORRELATIONS OF 0·7 OR MORE WITH OTHER MEMBERS OF THE GROUP)

	Number of correlations over 0·7 with other members of the group
Group I	
Quarrelsomeness	11
Bullying	8
Seeking attention of other children	8
Irritable	7
Resentfulness	7
Anger	6
Disobedience	6
Teasing other children	5
Verbal aggression to adults	4
Destructiveness	4
Playing with other children	4
Not learning from experience	3
(Alertness)	1
Group II	
Activity	2
Talkativeness	2
Happiness	1
Alertness	1
Group III	
Sustained effort	1
Facing facts	1
Other traits	
(Having no correlations over 0·7 with other traits)	
Physical aggression to adults	
Seeking adult attention	
Independence	
Affection	
Fear	
Anxiety	

Just as reliability can be improved by doubling the length of a test, so reliability of rating can be improved by combining the ratings from two or more observers, providing the ratings have been done independently and show positive correlations with each other (see Guilford, 1956; pp. 280–1 and 458–9). Since in the present study the ratings from ten nurses were available it was possible to find out to what extent reliability would be increased when the ratings from several nurses were combined. For this purpose five nurses out of the ten were picked at random and the sum of their ratings was correlated with the sum of the other five. The results of these calculations are shown in the last column of Table 3. They must be regarded as giving only an indication of the reliability of the ratings of five nurses (to get a better estimate every possible selection of five nurses should have been correlated with every other five). The results suggest that by combining the ratings of five nurses, the reliabilities are liable to be considerably increased and that many of them will reach a very satisfactory level. In this table, correlations between individual nurses of 0·48 and higher all reach apparently satisfactory levels (above 0·80) when the ratings of five nurses are combined. However, these figures must be regarded with some caution as we cannot guarantee that the nurses' ratings are entirely independent. The method of pooling nurses' ratings will tend to eliminate random individual errors, but it will not eliminate an error which is made by all the nurses. Such a group error might occur if all the nurses misunderstood the meaning of a trait description, or if all were biased by the knowledge that some children were on a certain drug.

After the ratings for each trait had been totalled over nurses, all the inter-correlations between the 24 traits were found. The number of children (19) was considered too small to warrant factor analysis, but the correlation matrix did indicate some clustering of traits. There was a large number of high inter-correlations between traits. Table 9 indicates the groups of traits which had correlations exceeding 0·7 with each other. It will be seen that there was a large group of traits of an aggressive nature which had high correlations with each other. This cluster of traits is suggestive of the factor of aggressive rebellion found in other studies (see Table 1). The second group of traits, which includes activity, talkativeness, happiness and alertness may possibly relate to the factor of hyperactivity (Table 1).

DISCUSSION

Independence of ratings

Agreement between nurses can only be used as an index of reliability if the nurses make their ratings independently. If the nurses were to discuss their ratings with each other this might increase the degree of agreement without increasing the reliability. In order to avoid this each nurse was instructed to base his assessments on *his own* observations and not to consult other nurses about them. Each nurse completed his rating sheets alone (see Table 2). It is unlikely, under these conditions, that the nurses consulted each other in filling in the rating sheets. However, the nurses might also have influenced each other by general conversation, or by the notes which they write from time to time about the children, which were accessible to all nurses; this might have occurred either during the period of rating or previously. Such factors as these cannot be excluded as possibly inflating the correlations found between nurses. In the ordinary conditions of rating children on the ward these possibilities of contamination cannot be avoided.

In this study we tried to minimize them by defining the traits in clear concrete terms and by careful instructions to the nurses to make their ratings independently and base them on their own observations. In view of these precautions it seems likely that the effect of communication between the nurses was small and that the major source of agreement was the actual behaviour of the children.

Possibility of halo effect

High correlations were found between traits having high nuisance value, such as quarrelsomeness, bullying, disobedience, irritability, resentfulness (Table 5). It may be suggested that these correlations are due to the operation of a negative "halo effect". The assessments might have been derived from a general impression of "naughtiness" rather than from separate observation of each type of behaviour, and the actual correlations between these traits might be very small. However, ratings are more liable to be based on halo effect when the rater has not had much opportunity to observe the behaviour to be rated or when the description of the behaviour to be rated is not very precise. In the present case the descriptions were clear and referred to obvious behaviour, which the nurse would have plenty of opportunity of observing in the case of these children in whom it occurred. There would therefore seem to be little need for the nurse to reort to "general impression" in making his rating. Thus, although "halo effect" cannot be excluded, it seems likely that the ratings were mainly based on observation of the actual behaviour to be rated and that these nuisance-value traits were in fact intercorrelated.

Type of trait best assessed

The traits on which there was satisfactory agreement and adequate spread of scores were practically all clear descriptions of obvious and frequently occurring types of behaviour, for example, quarrelsomeness, teasing, anger, activity. It is not surprising that such traits gave good agreement as there was little chance of differences in interpretation of the trait description and plenty of evidence to support the rating.

All the traits referring to behaviour towards other children, for example, quarrelsomeness, seeking attention of other children, playing with other children, gave satisfactory agreement and spread. On the other hand traits referring to a child's relationship with an adult, for example, physical aggression to adults, seeking adult attention and obedience, gave only poor to moderate agreement. The disagreement on these traits might be explained by the differences a child shows in his behaviour towards various nurses.

Where a trait described a feeling or emotion of which the overt expression was not very obvious, agreement was poor. Thus, the traits of affection, fear and anxiety gave poor agreement. The trait of happiness produced a narrow spread of scores and only low correlations between the nurses.

Some trait descriptions require interpretation of behaviour and nurses may interpret behaviour differently. This was almost certainly the case with the trait of "anxiety", where, in several instances, ratings of the same child ranged from "extremely anxious" to "never at all worried or anxious" (Table 6).

Problem of coverage

Most of the traits which gave good agreement between nurses were highly correlated with each other and appeared to measure the factor of "aggressive rebelliousness" (Table 1).

It would therefore be easy to construct a short set of scales to measure this factor reliably. But in order to obtain adequate coverage of behaviour it is desirable to measure other factors, such as hyperactivity, seclusiveness and anxiety (Table 1). Further work will be required to devise several measures of these factors which will give reliable assessments. The trait of activity was found to be assessed reliably and could be included as one measure of hyperactivity. In assessing the factor of "seclusiveness" the reliable item "plays with other children" (which, of course, has its negative end) could be used. The assessment of anxiety remains a problem. It will be necessary to try to find several concrete indications of anxiety which can be reliably assessed.

SUMMARY

Nineteen children were rated on 24 behaviour traits by ten nurses in a children's in-patient unit. The intercorrelations between nurses' ratings showed that a number of these traits could be rated with satisfactory agreement. The more obvious forms of difficult behaviour were rated more reliably than traits which were vague or required interpretation of behaviour. Intercorrelations between the traits used suggested that many of them were related to a factor of aggressive rebellion. Most of the traits related to this factor were rated reliably. Other possible factors such as hyperactivity, seclusiveness and anxiety were less well represented among the scales used. The assessments of anxiety were unreliable.

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CRITICAL NOTICE

Studies in Cognitive Development: Essays in Honour of Jean Piaget. Edited by D. ELKIND and J. H. FLAVELL. Oxford University Press, Oxford, 1969, pp. 503. £4.20.

NO ONE in Developmental Psychology has deserved a Festschrift more than Piaget. So it is quite appropriate that Elkind and Flavell should have produced one, and equally appropriate that it should consist of a series of papers, each of them a warm tribute by a prominent developmental psychologist. For Piaget's main impact, despite his epistemological leanings, has been on Developmental Psychology. A measure of the importance of his effect is that it is virtually impossible to imagine what Developmental Psychology would have been like today without him.

One certainty is that, had Piaget made no contributions to Developmental Psychology, it would have been a great deal more fragmented than it is now. If nothing else, his theory is massively comprehensive, and, as this book demonstrates, of direct relevance to psychologists working on problems as diverse as moral development in adolescents, habituation in three-month-old infants, social interaction between children, and between adults and children, language development, and the planning of a new mathematics syllabus. Piaget's work not only influences these very different sorts of research projects, but also provides a most effective link between them.

However, as Elkind and Flavell's team also clearly shows, the strength of Piaget's work is not merely in its all-embracing character. More important, perhaps, is its really astonishing originality. Questions as simple and basic as whether the six-month-old infant understands that objects go on existing once they have disappeared from view or whether the five-year-old child appreciates that a quantity of liquid poured from one container to another stays invariant through this perceptual transformation, seem obvious now, but they are only obvious once they have been asked. To have posed these questions in the first place, as Piaget did, represents a rare and important imagination.

He raised these, and many other equally novel and equally important issues, and did so against a background of an otherwise rigid and limited experimental psychology, whose proponents were almost universally unsympathetic to this kind of enquiry. This general antagonism has now largely disappeared, as indeed has the doctrinaire S–R approach which gave rise to it. Cognitive problems, that is to say problems of the way rules are acquired and affect behaviour, are now generally recognized as significant, meaningful and, above all, open to investigation. It is, in Developmental Psychology in particular that cognitive studies hold a central position, largely it should be noted through Piaget's efforts. It would indeed be churlish not to pay tribute to his persistence and his pioneering zeal. This timely book aptly reminds us of our debt to him.

The opening two chapters, one by McB. Hunt the other by Flavell and Wohlwill, are useful broad discussions of the nature of Piaget's influence. The former chapter contrasts Piaget's work with other approaches to development, while the latter is mainly concerned with the question of what is meant by a developmental "stage". The remaining chapters are more specific. Elkind provides a thoughtful chapter about the conservation experiment. Here he is a great deal more generous about the methods involved in this experiment than he was in a similar discussion three years earlier (Elkind, 1967): but that is to be expected in this kind of a book. White and Bruner, in two separate contributions, draw attention to Piaget's still neglected work on infants in the first two years of life. White's chapter is particularly interesting. His conclusion is that Piaget's work on infants is "far and away the most outstanding work of a truly remarkable observer. It is one of the few examples of behavioural research on a grand scale". White's estimate seems to me to be correct, and certainly there is still a considerable untapped potential in Piaget's work on the first two years of life. Bruner concentrates on the Genevan work on the development of visually guided reaching in the first year of life. Piaget's observations of the course of this development are probably still the most acute that we have of any infant behaviour, and so this topic deserves a whole chapter. Bruner reports some interesting research in this area. Other chapters discuss aspects of Piaget's research on older

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children. Two of these, it should be noted, are by Piaget's colleagues, Inhelder and Sinclair, and describe some of the current research in Geneva; the rest are by American authors, and are also mostly devoted to present research which has been inspired in one way or another by the Genevan Zeitgeist.

Perhaps the best of these chapters is the one by Lise Wallach, who provides a most lucid and stimulating account of the problems which have to be faced by anyone who is concerned to explain how a child comes to understand the invariance of quantity. This is easily the most famous question raised by Paiget, and this chapter clearly demonstrates both the importance of the question and the difficulties associated with answering it. Wallach's contribution is the nearest this book gets to a critical statement of any of Piaget's work and as such deserves the closest attention. Beilin also writes a chapter about the invariance question.

Other chapters include an account of developmental work on perception by Pollack, on cross-cultural research by Goodnow, on the effects of novelty by Charlesworth, on qualitative changes in development by Laurendeau and Pinard, and on the educational implications of Piaget's work by Siegel. Pollack's remarks on Piaget's perceptual work deserve to be read, especially since this is now the only area of Piaget's work which has never received anything like the attention which it deserves. This is probably because the perceptual experiments are rather difficult to follow, and because the conclusions drawn from them are not exactly earth-shattering. Nevertheless, it is rewarding to study Piaget's perceptual work, which is still probably one of the most comprehensive sets of experiments on perceptual development that we have. Charlesworth's and Pinard and Laurendeau's chapters are both of interest to anyone concerned with cognitive development. Finally, it should be noted that both Goodnow's account of cross-cultural work, and Siegel's of the implications of Piaget for education, though appreciative of Piaget, are both too general, too vague, and altogether too short to be of much value. These are both important topics, and we need weightier comments than this.

So the atmosphere of this book is one of warm exposition and approbation; this is appropriate for a Festschrift. One can ask, however, whether approbation is all that is deserved. For if we are to benefit from such an obviously important figure we should be aware of his weaknesses as well as his strengths. In fact, the most worrying thing about Piaget is that we still lack a comprehensive critical statement about his work. This is a very great pity, because there is no doubt that Piaget has made mistakes, and there do seem to be some serious pitfalls inherent in his approach. To make such a criticism properly would, of course, be an enormous work: but one can perhaps initially state what direction the criticism should take.

What is wrong with Piaget's work? I should say without any hesitation that his major weakness is his extremely cavalier approach to experimental evidence. His theory, important and original though it is, is based on the results of a series of experiments whose design is universally weak and whose interpretation is extremely hazardous. Nevertheless, Piaget interprets this evidence in his own way, and never attempts to discuss, let alone control for, the dozens of alternative explanations that can be quite plausibly given for it. He has adopted the techniques of experimental psychology, without proper regard for its discipline or its limitations. As a result, practically every one of his conclusions, however important and original, can and should be closely questioned and fiercely criticized.

This case, one should repeat, cannot be made completely in one article, but it can easily be shown that there is a case to be considered by discussing just one or two of his most central experiments. Let us take two of these, the conservation experiments and the transitivity experiments, and consider how valid are the conclusions that have been drawn from them.

Conservation

The best known, most influential, and most often repeated of Piaget's experiments are the conservation experiments. The question posed by these experiments is both simple and important. It is whether young children understand the principle of the invariance of quantity, that is, for example, whether they realize that the volume of liquid poured from one container to another of a different shape is unchanged by such a perceptual transformation.

The question itself is a very good one for a number of reasons. The first is that it must have taken an extraordinary degree of imagination to conceive that children may not understand something which to any adult seems perfectly obvious. Secondly, the question has important educational implications, since a child who does not understand the invariance of the number of objects in a group whose appearance has been transformed, is not in a position to understand even the simplest form of arithmetical instruction. Thirdly, the question raises some central theoretical issues. The most important tenet in Piaget's account of intellectual development between the ages of five and eleven years is that at the beginning of this period children are entirely dominated by their immediate perceptual input, which they cannot manipulate in any effective way. In the following years they gradually free themselves from this domination. One result of this change is that older children can mentally cancel out the effects of any perceptual transformation of quantity by working out that the inverse transformation would bring it back to its former perceptual state. Thus at five years the perceptually dominated child treats a perceptual change as an actual change, while by roughly eight years, by going beyond the immediate perceptual evidence, he can understand the invariance of quantity in the face of any perceptual transformation.

That is Piaget's hypothesis, and the main point here is that the evidence for this hypothesis, which comes from the results of the conservation experiments, is really very weak indeed. The conservation experiment is a two-stage affair. In the first stage the child is asked to compare two identical quantities, A and B, for example, two glasses of water as in Fig. 1 or two rows of counters as in Fig. 2.

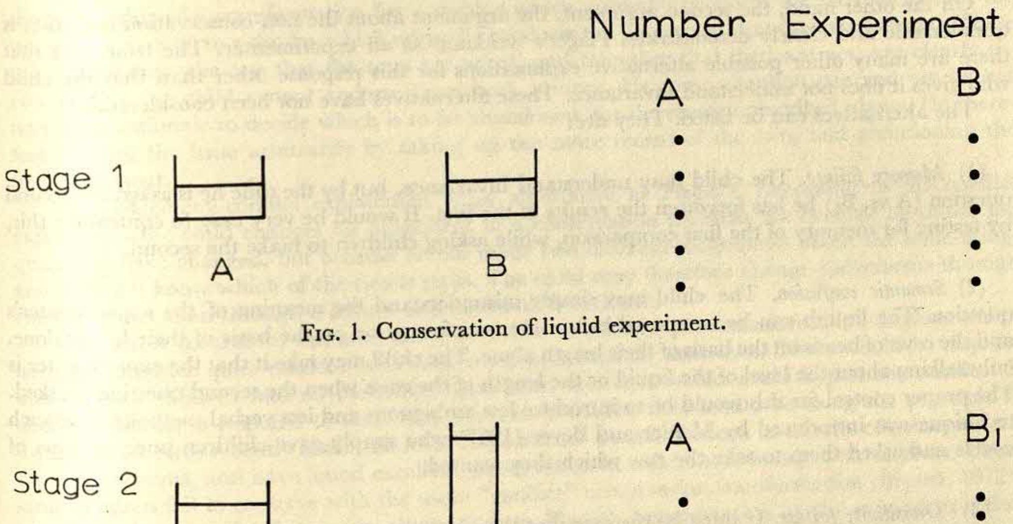

FIG. 1. Conservation of liquid experiment.

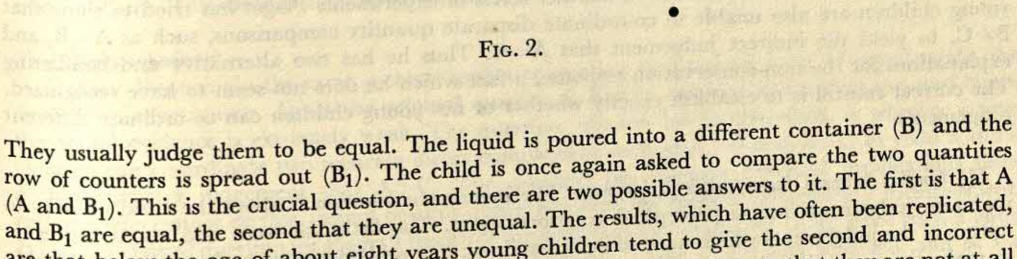

FIG. 2.

They usually judge them to be equal. The liquid is poured into a different container (B) and the row of counters is spread out (B_1). The child is once again asked to compare the two quantities (A and B_1). This is the crucial question, and there are two possible answers to it. The first is that A and B_1 are equal, the second that they are unequal. The results, which have often been replicated, are that below the age of about eight years young children tend to give the second and incorrect answer. They say that A and B_1 are unequal, and it is very important to note that they are not at all random in their choice of which has the greater quantity. They tend to state that the glass with the higher level of liquid has more in it, and that the longer of the two rows is the more numerous one. Older children, on the other hand, tend to give the correct response that A and B_1 are equal. Their response is invariant over the transformation.

The correct reply is known as the conservation response, the incorrect as the non-conservation response. Piaget's interpretation of the conservation response is that it shows that the child understands that the quantity B has remained invariant during its transformation to B_1. His interpretation of the non-conservation response is that the younger child does not understand this invariance. It is argued that the child who says that A equals B and then later says that B_1 is greater than A, must think that the perceptual transformation has actually increased B's quantity.

How do these interpretations stand up? The answer is that while the first is impeccable, the second is extremely dubious. The interpretation of the conservation response must be right, because there seems to be no other way in which the child could solve the problem without using the principle of invariance. Considering the liquid experiment, there is absolutely no way in which the child could consistently and correctly compare A and B_1, if these were presented on their own. Therefore, when the child answers correctly in Stage 2 of the conservation experiment, he must do so on the basis of information carried over from the pre-transformation display. The child must in some way reason that because A equals B, and B equals B_1 (the invariance principle) A must also equal B_1. Exactly the same analysis applies to the number experiment, since a child who could not count properly could not compare A and B_1 correctly without information carried over the transformation from the previous display.

On the other hand, the second argument, the argument about the non-conservation response, is questionable and clearly demonstrates Piaget's weakness as an experimenter. The trouble is that there are many other possible alternative explanations for this response other than that the child who gives it does not understand invariance. These alternatives have not been considered.

The alternatives can be listed. They are:

(1) *Memory failure.* The child may understand invariance, but by the time he is asked the second question (A vs. B_1) he has forgotten the results of the first. It would be very easy to control for this, by testing for memory of the first comparison, while asking children to make the second.

(2) *Semantic confusion.* The child may simply misunderstand the meaning of the experimenter's question. The liquids can be compared before the transformation on the basis of their levels alone, and the rows of beads on the basis of their length alone. The child may take it that the experimenter is only talking about the level of the liquid or the length of the rows when the second question is asked. The proper control for this would be to introduce less ambiguous and less verbal methods. One such technique was introduced by Mehler and Bever (1967) who simply gave children unequal rows of sweets and asked them to take the row which they wanted.

(3) *Transitivity failure.* It must be the case that the correct response depends on the reasoning that $A=B$, $B=B_1$, and therefore that $A=B_1$. It may be that the child who makes the wrong response does so because, although he understands the invariance of B when transformed into B_1, he nevertheless cannot combine the first two pieces of information ($A=B$, $B=B_1$) to yield the third ($A=B_1$). There is a certain irony here, since in another series of experiments Piaget has tried to show that young children are also unable to co-ordinate disparate quantity comparisons, such as $A=B$, and $B=C$, to yield the indirect judgement that $A=C$. Thus he has two alternative and conflicting explanations for the non-conservation response, a fact which he does not seem to have recognized. The correct control is to establish exactly whether or not young children can co-ordinate different judgements.

(4) *Conflict between incompatible judgements.* The invariance question is about the child's ability to maintain judgements across perceptual transformations. Too little has been said about the exact nature of the judgements which have to be maintained. Yet we know enough about them to be able to make the suggestion that non-conservation responses may be due not to a failure to understand invariance, but simply to an inability to distinguish which of two competing judgements is actually the correct one in a conservation problem.

Children who cannot yet count, do nevertheless form judgements about quantity quite consistently For example, they consistently judge that two equal rows of beads, lined alongside one another like two ranks of soldiers, are equal. Here they appear to be using the "one-to-one correspondence" cue to compare the two rows, a cue which is, of course, entirely correct.

However, the most significant thing about the prenumerate child's consistent quantity judgements is that these are in some cases quite incorrectly based. These children can make a consistent judgement, consistent that is both within and across subjects, and yet that judgement can be quite incorrect. For example, as early as 1890, Binet showed that when such children are asked to compare two unequal length rows, they invariably judge the longer row as the more numerous, whether it is or not. They are using the cue of length to judge number, and this cue, of course, is incorrect. Thus, although some of their judgements are correctly based, others are not.

Now the very fact that some of the bases for their quantity judgements are incorrect has some very serious implications. Basically it must mean that young children do not really know what is and what is not a correct basis for a quantity judgement: if they did they would not use the incorrect length cue with such consistency. If follows that if they are faced with a conflict between a correct and an incorrect judgement about the same thing they will not be able to distinguish which is the better and which the worse of these two judgements. If they do not know what is the correct basis for a quantity judgement, they cannot distinguish between a good and a bad judgement.

The last statement is not a mere tautology. The number conservation experiment, as Fig. 2 shows, consists of a transformation for a display which normally produces the judgement that the two rows are equal to a display which normally produces the judgement that they are unequal. These two judgements, the one that the rows are equal, and the other that they are not, are clearly incompatible: the child cannot endorse them both at once. He must abandon one and yet he has no proper rationale to decide which is to be abandoned, for the reasons described above. He therefore resolves the issue arbitrarily by taking up the more recent of the two, and abandoning the first judgement.

This judgement conflict explanation is an alternative to Piaget's. According to the conflict explanation the child changes his judgement in a conservation problem not because he thinks the quantities have changed, but because he has made two different judgements about the same thing, and does not know which of the two is right. The child may therefore change judgements through conflict rather than through a failure to understand invariance.

The correct control for this alternative would be to institute post-transformation displays which normally produce quite random behaviour when presented on their own. These would be displays about which children had no particular hypothesis, and thus would avoid hypothesis conflict. If children transfer a response to these across a transformation they would be using the principle of invariance. I have recently instituted such "no conflict" transformations in a series of conservation-type experiments, and have found excellent conservation in children as young as three years. These same children fail to conserve with the usual "conflict" conservation transformation (Bryant, 1972).

These then are the four main alternatives to Piaget's interpretation of the non-conservation response. Put together they present a very worrying picture. The conclusion that young children do not understand invariance is probably the most important in Piaget's theory, and yet it is still unsubstantiated. There are no effective controls to his experiment and there are few attempts to institute them. The conservation design is, therefore, thoroughly incomplete.

Transitivity experiment

Rather distressingly the same picture applies to another well-known series of experiments, the transitivity experiments. Again the original question is simple, original and important, and again the actual evidence is extremely weak. The question, already briefly described, is whether young children can co-ordinate two separate direct comparisons such as A>B and B>C to yeild a think a third indirect judgement that A>C. The question has obvious practical implications since children who cannot do this, cannot possibly appreciate even the simplest principles of measurement. It is also a central question for Piaget's theory of the perceptually dominated child, since such a child would not be able to combine separate perceptual inputs. These would stay separate, and so the child would be unable to achieve any kind of transitive inference.

Piaget's techniques for testing the child's ability to make transitive inferences vary. However, whatever the exact form of the transitivity experiment, it always comes in three stages. The first two are two direct quantity comparisons (either A>B and B>C or A=B and B=C) given separately, and they are followed by the third question, which is about A and C. (The stages have to be successive, since A and C must never be directly compared.) If the child answers the third question correctly, Piaget argues that the child can make transitive inferences, and if the child fails, the argument is that he is incapable of making these inferences. In fact, children up to the age of about seven years tend to fail in this task, while older children succeed.

However, Piaget's suggestions both about successes and about failures in this task are suspect. Let us take first of all the children who succeed. It may be that they answer the third question correctly by combining the first two comparisons, in the way that Piaget suggests. But it may also be that they are simply parroting a verbal label carried over from the original comparisons, without making any proper inference. Where $A > B$ and $B > C$, A is always the "larger" and C always the "smaller" in the original comparisons: but "larger" is the correct response to A and "smaller" to C in the transitive AC comparisons. The child could simply be repeating these labels without having worked through the common relationship of B to A and C. That such parroting is likely in young children has very often been demonstrated in discrimination learning experiments in which children are forced to use verbal labels.

The control for this transfer of labels is simple. It is to increase the number of stimuli and the number of direct comparisons. If there are five stimuli and four direct comparisons, $A > B$, $B > C$, $C > D$ and $D > E$, you have three stimuli B, C and D, which are the smaller in one of these comparisons and the larger in another. The transitive comparison, which can be made out of these three, and which, therefore, avoids the changes of absolute transfer, is the indirect comparison between B and D. The BD comparison thus would represent the crucial transitive question.

This, however, is not enough, because errors in the transitivity task are also ambiguous. An error does not necessarily indicate, as Piaget suggests it does, a transitive failure. It could simply be due to a failure in memory. The child who cannot answer the AC question might at the time simply have forgotten one or both of the original direct comparisons (AB, BC). This is not controlled for, and yet the controls are simple. Two things should be done. The first is to train the child very thoroughly on the original direct comparisons so that he is likely to remember them. The second is to test for the memory of these direct comparisons, at the same time as the transitive questions are actually asked.

All these controls have recently been instituted in an experiment which I carried out jointly with Trabasso (Bryant and Trabasso, 1971), and our results demonstrate very strongly that even children as young as four years are very well able to make transitive inferences. Their failures in the traditional experiments are almost certainly memory failures. There can be no doubt that they do possess a basic and effective transitive ability. Thus here again Piaget's experimental errors have led him to the wrong conclusions.

Conclusion

Piaget's theory is one which is based on experimental evidence, and yet much of this evidence is shaky. I have tried to make this case with two of his most basic techniques. These were selected because they are certainly the most important of his cognitive tasks, and because, ironically enough, they are probably the best designed. It is indeed all too easy to take his other experiments and subject them to exactly the same kind of criticism. To take just two more examples, the *class inclusion* experiments entail the most elaborate verbal questions, and almost certainly give rise to semantic confusions, and errors in the *seriation* tasks can very easily be attributed to memory failures.

Moreover, there are other worrying aspects of the clearly uneasy relationship between Piaget's theory and Piaget's experiments. In particular, his ideas about the causes of developmental changes are actually untestable, because they are couched in such a very general way. No one has suggested how to test for the existence of assimilation and accommodation as mechanisms of cognitive change, and yet the impression given by Piaget is that he considers his experiments as tests of these notions. However, it is one thing to chart developmental changes, and quite another to investigate the causes of these changes. This is an issue which has been discussed elsewhere (Bryant, 1971).

What then is to be done? Certainly, Piaget is far too important to be left to the Piagetitians. We urgently need a fair and comprehensive critical statement about his work. I am not suggesting a work of demolition: we just need to know two things. The first is what his actual, objective discoveries about cognitive development are, and my suggestion is that there are very few of these which cannot be questioned with some vigour. Secondly, we need to know how to provide the correct answers to Piaget's questions, where the existing evidence is weak. The point is that even where the experiments are bad, the questions which they are designed to answer are always excellent. So a host of experiments needs to be done, and to be done with great care and discipline.

Elkind and Flavell's collection of papers effectively reminds us of Piaget's greatness. We should remember, however, that if he is to be treated seriously, he should also be treated critically.

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BOOK REVIEWS

The Theory and Practice of Mental Health Consultation. G. Caplan, Tavistock Publications, London, 1970, pp. 397. £3.25.

Every practising psychiatrist faces the problem that his speciality can touch only a fraction of the total number of people who might wish to seek his aid. One solution is to define the limits of his work, to restrict access to his clinic to those patients referred solely through medical channels, and to use therapeutic concepts parallel with, or related to, those which have been created in physical medicine. Within these boundaries psychiatry is a secondary service, responding to the referrals from those who have responsibility for the primary and continuing care of the patient. This pattern, which is hallowed by medical tradition, has been responsible for most of the progress in clinical psychiatry. The procedures of diagnosis and treatment are part of a comprehensive system which depends upon the categorization of mental illness.

Fruitful as this system has been, there nevertheless remains a problem in which mental illness differs from physical illness. Most of the features by which mental illness is recognized are present in some degree in the normal individual and, indeed, the outside community has been shown by Querido (1963) to contain as many individuals with comparable experiences as those who have sought psychiatric care and have become patients. Moreover, every professional person who deals with the needs of the whole range of the community is called upon to deal with people who give indications of mental illness but who, nevertheless, maintain their entitlements to the primary services of education, housing, social security, family medicine, and the personal social services. The psychiatrist, therefore, who confines his work to individuals who cross the threshold of the hospital or clinic is excluding himself from wide areas of need in which he could make a contribution.

A choice has to be made, but any psychiatrist who takes his psychiatric knowledge out of its clinical setting and into the field which is shared by other professions has to make considerable personal and conceptual adaptations. He has to relinquish the exclusive authority that is granted to the doctor when treating acute illness and he has to develop a new kind of skill through which he can put himself at the disposal of non-psychiatric professional workers who deal with the psychiatric patient in the community setting. A new theoretical and practical system has had to be devised and no-one has done more to build up such a system than Caplan. Under the label of "community health consultation" he has been responsible for the teaching of a disciplined psychiatric contribution to the work of other professions.

Caplan originally based his ideas on experiences in Israel, where he worked on a consultation programme set up by the Lasker Mental Hygiene Centre in Jerusalem to help the child care and educational workers responsible for residential institutions which had to cope with immigrant children, many of whom had been rescued from the concentration camps of Nazi-occupied Europe. Caplan continued and developed this work in Harvard and was also able to benefit from the ideas of Lindemann who was working with the Wellesley Human Relations Service. Caplan (1959) presented his early formulations in a publication of the U.S. Department of Health, Education and Welfare. Subsequent publications include "Approach to Community Mental Health" (1961), and he has also been the editor and co-ordinator of a publication entitled "Prevention of Mental Disorder in Children" (1961).

In this present volume Caplan has delineated categories of different kinds of mental health consultation and has described the differences in their practice. The book embodies some of the communications of his teaching seminars, which have been held annually at the Tavistock Clinic for over 10 years and attended by psychiatrists, public health staff, and social workers. His name is probably as familiar to community workers in Britain as that of any British psychiatrist.

Preoccupation with these fringe areas has its hazards. The process of consultation is not a clinical activity of the kind for which doctors have been trained, and the relationship between consultant and consultee may fail to fit the expectations. Many prospective consultees, expert in their own profession, may believe that what they need, and what they are going to get, is a few easy lessons in psychiatry. The consultant himself can easily be seduced into denigrating the clinical aspect of the psychiatrist's work because there are so many interesting byways in which he can take his psychiatric knowledge. He may feel justified in deserting the clinical setting completely because, in any case, it has been asserted that psychiatric hospitals and clinics can deal with only 10 or 20 per cent of those persons in the community who can be broadly categorized as being mentally disordered. The remaining 90 or 80 per cent have a justifiable call on his skills, even if his contact with them is only indirect.

In these circumstances the consultant may find himself in the unenviable position of being alienated from his psychiatric colleagues and yet not completely secure in his identity outside the main stream.

Caplan shows that when the consultant makes the journey from his clinic to the place of work of the consultee, he has to walk out of one culture into another. Psychiatrists, during their training and their work, build up a kind of understanding and a language which they may share with some kinds of social worker and psychologists, but although some of the words have become widely current, the ideas which the words embody may be difficult, disturbing and even threatening to those who have not become gradually familiar with them. The consultant must neither give the full psychiatric explanation that he would use in his own professional formulation nor must he use jargon that refers to those ideas as if they were common knowledge.

One section of the book deals with the building up of relationships with a consultee institution and with a consultee. In this section Caplan describes some of the manoeuvres used to win confidence and to establish channels of communication between himself, the institution, and the consultees.

Reference is made to a "Consultation Contract", which is an agreement between the consultant and the consultees about their complementary roles. In this sense it would resemble the bargain which is made between the psychotherapist and the patient with their mutual obligations and expectations, in which the latter is given some understanding of the kind of communications that are expected from him. Here, however, it goes further because, although the contract is not a legal document, there are formal negotiations. The "contract" specifies the relationship between the consultant and the consultee institution. Discussions during the negotiation pass up and down the hierarchical system of the organization which employs the prospective consultee. The contract is formulated in writing; ". . . this does not have to be a formal document. Usually it takes the form of an exchange of letters."

One aspect of this contract is that a fee passes from the institution receiving the service either to the consultant himself or to the organization which the consultant represents. These details are obviously essential to the system which Caplan is describing in the present book, but the reviewer would hazard a guess that in the United Kingdom it would be impossible to envisage negotiations of this kind between any branch of the social services and a consultant psychiatrist in the National Health Service.

Some aspects of the actual practice are given in detail. The consultant's activity is a directed one, in contrast with the legendary passivity of the psychoanalyst. He has to be aware of the anxiety in the consultee, (a) about the case, and (b) about the consultant, and he has to be aware that he will be used as a role model. In building up the description of these processes some of the ideas seem to stretch the consultant's functions.

"A fundamental message of consultation is that if one spends enough time and collects enough information, one can eventually discover the pattern of forces in the case and then understand the attitudes and behaviour of the people involved as logical manifestations of their interacting motivations and goal-oriented strivings, however strange they may initially appear."

It would seem reasonable to the reviewer that the consultant should be able to preserve an entitlement *not* to discover a rational understandable pattern.

Some points are made crystal clear. The consultation is centred on the work problem and, no matter how much the consultee may seek help from the consultant with personal problems, this request must be refused. The consultation is in no sense personal psychotherapy. Techniques, therefore, have to be developed in order to avoid exchanges which could develop into the routine of psychotherapeutic transactions.

The consultee presents a case and then asks a question about what should be done for his client.

The consultant must be aware of the fact that this can easily pass into a discussion of the consultee's personal reactions to the case and, from there, into aspects of the consultee's background and personality which lie behind such reactions. The consultant's task is to prevent this and, therefore, he must phrase his responses, which are intended to invite more information, in terms which elicit factual or concrete replies. This in sharp contrast to a psychotherapist's questions which are open-ended.

Long rapid monologues of the consultee should be interrupted by questions. The consultant should beware of generalizations by the consultee (and, one might add, of generalizations of his own). The consultation is not the place to enlarge upon popular or professional ideas about sex or rebellious adolescents!

Some of the problems presented by the consultee possess a "theme" which has a personal resonance. It is not consultation to explore the personal history of the consultee for the source of this resonance. The consultant's function is to widen the range of ideas and, when the consultee fits the individual clients and their relatives into stereotypes, the consultant merely asks the consultee to shed further light on this aspect of the story. He does not cast doubt on the label but encourages an extension of the description.

The technique is described as "Theme Interference Reduction". The focus is on the client. The consultant's aim is to undo the tie to the case which the stereotyped theme provides. The consultee is, incidentally, given additional knowledge and repertoires of response. The four main reasons for seeking consultation are lack of knowledge, lack of skill, lack of self-confidence, lack of professional objectivity. The consultation offers something for all these needs, including the use of "parables" which allow the main theme to be seen in metaphors that differ radically from the stereotyped theme. There is no uncovering of the consultee's feeling about the theme, but there is a "relaxation in the consultee's superego pressures relating to the underlying conflict".

The next type of consultation refers to the *administration* of institutions and is discussed under the heading "Program Structured Administrative Consultation". It somewhat resembles management consultancy in being directed to some predicament in the organization of an institution, in its planning, or in the implementation of its policy.

The structure of institutions no doubt has its health and its sicknesses in a figurative sense, and there are professions now springing up which have laid claim to authority in this field. The reviewer can see no reason why a training in psychiatry should provide authorization for this kind of work, and yet Caplan himself, and members of his staff, have had assignments from Government, from Provincial authorities, and from Presidential enterprises such as the Peace Corps. They appear to succeed where most other psychiatric organizations would be unlikely to receive or to respond to an invitation to undertake work of this kind.

The book deals next with the *training* for mental health consultation. There is obviously a demand for these facilities because the U.S.A. 1963 Community Mental Health Centres Act specifies that "mental health consultation must be included among the five basic services that must be provided by all community mental health programs seeking federal funding . . .". This demand surely could not have come into existence without some awareness of the reputation of the Harvard School of Public Health in which these ideas were worked out. Fellows-in-training are given an opportunity to work in Boston with existing organizations. They are taught methods of making relationships with prospective consumer organizations, and the methods of salesmanship employed would add grace to many commercial undertakings.

Last of all is the contribution of the mental health consultant to *community action*. Disputes between institutions in the community, racial conflict, and industrial disputes are all given a "working over" in a way which shows how much a psychiatrist can contribute to the clearing up of the irrational behaviour in various community relationships. There are many new and interesting ideas. When the leaders of a discontented group begin to negotiate with representatives of an establishment organization, one of the hazards is that the former learn gradually to understand, and identify with, their opponents. They get close to settlements and then, at the point when they realise that they have to report back to the group which they represent, they feel compelled to return to their original grievances. They become uncomfortably aware that their total group have not passed through their own experience of sharing the views of the opponents.

No doubt there is some branch of psychiatry which could make a contribution, along with social psychology and other disciplines, to the aid of community relationships; but it is impossible to envisage any psychiatrist in the U.K. being given the role of mediator in a political or industrial dispute in his professional capacity. It would be an important exercise to attempt to identify the qualities of those public figures who have, in fact, accepted such assignments, and then to enquire whether psychiatric training is as relevant as (say) legal experience. The total field of suitable candidates is still likely to be small.

The main interest in this country would seem to be in the *case consultation*, and this should be one of the most important growing points of the mental health services. The creation of social service departments has, in some senses, provided a separation between social work and clinical psychiatry. Mental Health Consultation could help to build bridges between the services.

The Child Guidance Clinic has a position which is yet to be determined, but, whatever its future, its professional staff will need to go outside the clinic into schools and community homes, and it will also be called upon to provide links with adult psychiatric services.

It would be deplorable, however, if psychiatrists were to embark upon the consultation process without learning new techniques which distinguish it from clinical activity. Methods of consultation will have to be devised in which the whole child guidance team, or different combinations of the team, will be employed.

This book presents Caplan's contribution to existing knowledge of the mental health consultation, and it provides a working manual which is essential for all who venture into the community beyond the clinic walls.

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The Mentally Retarded Child and His Family. A Multidisciplinary Handbook. Ed. R. KOCH and J. C. DOBSON. Brunner/Mazel, New York, 1971, pp. xxix + 504. $15.

THIS IS an ambitious book which however only goes part way towards substantiating the publisher's claim that it is "encyclopaedic in scope, completely integrated and a highly practical guide for every professional and student in all the disciplines concerned with mentally retarded children". As with most multi-author text books there is great variation of style and of level of approach. There is also inevitably some overlapping. A strength of the book is that its American authors write from a standpoint of concern and practical involvement, and most of their material is also relevant to practice in other countries.

In the first half of the book the contributing editors, Professors Koch and Dobson, write well and exceptionally clearly on their chosen subjects, the origins of intelligence, biological factors in causation, and the multidisciplinary team approach to diagnosis and treatment. Dobson's first chapter is stimulating and right up-to-date (including discussion of Jensen's controversial views on genetic inheritance of I.Q. variation). He stresses the profound importance of early (pre-school) learning and the need for compensatory (remedial) learning programmes to be organized, extending right down to infancy. Dr. Mercer discusses the implications of diagnosis from various standpoints. Retardates have subnormal intellectual ability together with subnormal adaptive behaviour. Low I.Q. alone does not suffice to define a child's status as retardate.

There are good concise chapters on various aspects of aetiology. The joint authors of the chapter on Down's syndrome explain, with clear and helpful illustrations, the more complicated cytogenics in this condition that have been revealed by recent study of the various types.

The chapters on multidisciplinary diagnostic approaches are more variable and the rather detailed account of psychological testing techniques, with many photographs of standard equipment, is less illuminating than one anticipated in this important field. The point is well made at the end of this section that the diagnostic process can be a very unproductive affair in the life of a retarded child unless the recommendations for effective treatment are implemented. This is the other side of the coin to the possible over-emphasis on assessment and re-assessment which is now fashionable. Facilities lag well behind diagnostic sophistication. These authors advocate a Los Angeles model with an educational consultant as co-ordinator of educational services, to synthesize the pertinent information from the team evaluation. Such an educational consultant, in a medical setting, is seen as the link between the diagnostic and education processes.

A chapter on nursery schools advocates reappraisal of the concept that children under three should not participate in group activities. Very young mentally handicapped children can profit educationally and emotionally from this experience, and the parent–child relationship is likely to be improved as well. This is in line with the 1971 Spastics Society Educational Seminar, which was wholly devoted to this topic.

Meyers and his colleagues give a lucid introduction to learning principles in retardation, including operant conditioning. This is an actively developing field and those interested may want to pursue the subject by exploring related papers by British authors. The chapters on practical approaches to remedial education are somewhat perfunctory.

With the section on psycho-social aspects we encounter the vice of elaborate and jargon-ridden styles of writing. Zigler discusses interesting studies on motivation, but admits that the work is recent and results only tentative. Menolascino has an interestingly original viewpoint concerning psychiatric aspects, but his presentation is exuberant and undisciplined. His diagnostic technique of a structured play interview is to be commended, as so often these children are unresponsive in a free-play situation and the psychiatrist is obliged to rely primarily on second-hand accounts of their behaviour. He goes on to discuss psychotherapy, counselling and pharmacological adjuncts. Having evaluated a series of over 600 children suspected of mental retardation, he concludes that behavioural disorders in young mentally retarded children are relatively frequent and different from those noted in non-retarded children. He stresses that the psychiatric treatment and management aspects of emotional disturbances in retarded children has been largely neglected but that the need for such services does not vanish as the I.Q. drops below 70. In England, the very recent inauguration of a special experimental unit for severely disturbed mentally handicapped children at The Bethlem Royal and Maudsley Hospitals is a practical expression of the philosophy advocated in Dr. Menolascino's chapter, which is one of particular relevance for readers of this Journal.

The final glossary is muddled and bizarre in choice of items included; it would be better omitted from future editions, and the whole book would gain from tighter editorial control. Printing and presentation are exemplary.

P. GRAHAME WOOLF

The Neurological Examination of the Child with Minor Nervous Dysfunction. Clinics in Developmental Medicine No. 38. BERT C. L. TOUWEN and HEINZ F. R. PRECHTE. Spastics Int. Med. Publ. and Heinemann, London, 1970, pp. vi + 105. £2.25.

PRECHTL and his colleagues at Groningen have been pioneers in the development of techniques of neurological assessment for babies and they now present an account of their methods of examination in the older child. The neurological methods used in the adult are inadequate and sometimes inappropriate to the evaluation of the child. This is particularly the case with children whose problems concern developmental retardation or minor departures from normality rather than a well-recognized disease state or neurological syndrome. This book describes clearly just what should be done in this situation and the written account is aided by the ample provision of suitable illustrations. The procedure for eliciting and the method of recording each sign are given in an easily-followed form and there is a brief account of the clinical significance of each finding. In rather idiosyncratic fashion, the authors regard the assessment of speech and language as outside the scope of a neurological examination. Few paediatric neurologists would agree with this view. The book clearly notes that a child's developmental level affects his neurological performance but psychologists may feel that the measurements of functions such as co-ordination does not adequately take into account developmental changes. The findings and conclusions on the neurological assessment of school-age children are based on the authors' very considerable clinical experience and systematic follow-up studies but evidence on reliability and validity are not included in this book. It is very much to be hoped that these data will be published later as the scheme given here seems both well thought out and practical. In the meanwhile the present book provides a means of carrying out a well-organized neurological examination particularly suitable for the child with suspected minor neurological dysfunction and hence of considerable interest to child psychiatrists.

MICHAEL RUTTER

Spotlight on Physical and Mental Assessment. JESSIE PARFIT. National Children's Bureau, London, 1971, pp. xiv + 130. £4.50.

Assessment of Children. (Report of a Study Group set up by the Chief Social Work Adviser, Social Work Services Group.) Chairman: BETI JONES. S.W.S.G. 1971, pp. ii + 25.

CHRONIC disabling conditions produce handicaps by their direct effects; but they also lead to a series of secondary problems which may be even more serious than the primary disabilities. To take one example, a spastic child has inadequate control of his muscles, which has the direct effect of limiting his mobility. Various deformities may follow from this unless prevented by active treatment. The less obvious secondary handicaps include, for example, lack of the sensory and kinaesthetic experiences necessary for learning about the environment, and emotional immaturity because of permanent physical dependence on others. In addition, other people may adopt attitudes towards a spastic person (perhaps rejection, resentment, or over-protection), which also have important consequences. The picture may be further complicated by the presence of additional handicaps, such as deafness, aphasia, or visual perceptual problems, which can be overlooked because of the difficulty of carrying out the necessary examinations.

Many of the secondary difficulties can be minimized by proper treatment and management. In the case of handicaps dating from birth or the first few years of life, effective prevention of secondary problems depends upon early detection, which is possible only if there are services providing adequate screening and assessment.

In her book, Dr. Parfit outlines the administrative organization of a variety of centres for the assessment of mental and physical development, and the detection of handicaps. Ten of those described are run by local authorities; five by hospital clinics; seven are centres in which assessment is associated with day or residential observation facilities; nine centres are associated with schools; six are associated with hospitals for the mentally handicapped; and six are regional centres. The last section gives extracts from relevant publications. As Dr. Parfit points out, all the units are different from each other, and the assessment services are fragmented and "departmentalized in relation to community provision as a whole". Some units deal only with handicapped children referred to them by various agencies, while others (especially those run by local authorities) compile registers of children at risk, run observation registers, or else have regular screening available for the whole child population.

The book is intended as a reference for those who are planning an assessment service, and will be of great value for this purpose. The list of nine requirements for a truly comprehensive assessment of a child, given in the section entitled "Overview", is an excellent summary of the aims of the assessment process.

The report of the Study Group *Assessment of Children* discusses the role of the Scottish Social Work departments in assessment of children. It deals mainly with children referred for social work help, because of delinquency, deprivation or emotional disorder, although there is a section on children with physical and mental handicaps. The Study Group recommends multi-disciplinary teams with members from the educational and medical, as well as the social work departments.

LORNA WING

Handicap. A Study of Physically Handicapped Children and their Families. JOAN K. MCMICHAEL. Staples Press, London, 1971, pp. xii + 208. £2.75.

FROM HER vantage point as the School Medical Officer, Dr. McMichael has given in this book a detailed account of the problems of 50 children who attended a Primary Day School in London for the physically handicapped.

The aims of the study were to detail information on aspects of the children's medical supervision and on the associated psychological, social and educational difficulties of them and their families. The fieldwork was carried out in 1960 and 1961; questionnaires based on those used by Tizard and Grad in their study, *The Mentally Handicapped and their Families,* were employed to gain the information and they were supplemented by reports from teachers and other sources.

In discussing her children's medical supervision, the author points out some serious shortcomings among which the fragmentation of their medical care stands out. Among the educational problems emphasized are the loss of school-time for reasons of illness, the conflicting demands on the children by teaching and therapy staff that are seen from time to time, and the specific impairments that many children have in communication and manual abilities. A high incidence of emotional problems was noted (24 per cent were referred to Child Guidance Clinics) and the subjects' emotional adjustment and symptomatology are analysed in depth. In a detailed discussion of the social problems experienced by the children's families, the author's active concern is apparent and she rightly stresses that this is a sphere in which much more could be accomplished.

This is a small study, and largely anecdotal in character. It would have been a suitable forum therefore for the author to develop further her arguments for improved medical, psychological and social facilities for physically handicapped children and their families by reviewing the literature more widely, by including a discussion on the specific educational needs of these children, and by following up her own group in the ten-year interval since 1961. Unfortunately none of these have been done.

Nevertheless, the book does successfully describe the range of difficulties that are met by these children and their families, and in this respect a very useful function is subserved. Similarly, by recounting the many roles available to the doctor in a special school, a valuable and timely service has been given both to doctors in the School Health Service and those outside it. For these reasons, and because the book is lucidly written, it can be recommended for professional staff who are concerned with special schools.

LEWIS ROSENBLOOM

Children as Individuals. An Analytical Psychologist's Study of Child Development. MICHAEL FORDHAM. Hodder & Stoughton, London, 1969, pp. 223. £2.10.

MICHAEL FORDHAM'S *Children as Individuals* is a greatly revised and expanded edition of his earlier work *The Life of Childhood* (1944). It will be of interest to all practising analytic therapy with children, as well as to students of analytical psychology. Although deriving from Jungian thought and from the work of the London Society for Analytical Psychology, much of Dr. Fordham's thinking is truly original and marks important developments in the thinking of the London group.

The first half of the book (Chapters 1–4) describes concepts of childhood development, the importance of play, dreams, paintings, etc., which are fairly orthodox and for that reason appear to the reviewer less interesting than the second half. The clinical material collected from what the author describes as his pre-analytic work, although interesting, is difficult to fully understand. This is because, although the material was gathered in a therapy setting, the transference roots are not clearly presented.

In the second part of the book (Chapters 5–10) Dr. Fordham presents the more recent developments in his thinking and it is here, especially in Chapters 5 and 6, that, in the reviewer's opinion, the greatest interest lies. The model put forward to account for psychic development in the first years of life is an important and original contribution to analytical psychology and to the general field of child development. The importance of the model to the reviewer is that it attempts to relate relevant concepts from the work of Jung, especially that of archetypes, to the ideas of Mrs. Klein and other analytic thinkers and to concepts derived from other fields such as ethology.

It seems unlikely that Dr. Fordham's work will receive the attention it undoubtedly deserves. Some blame for this at least must be attached to his style of writing. At many crucial points it is so condensed that those not already familiar with his thinking will find difficulty in following his argument. The book is a short one and in many areas a more detailed presentation, with clear examples, would have been helpful. Similar criticisms apply to Chapters 7–10. The ideas presented about the family and the social settings need to be worked out in more detail to be really useful. Dr. Fordham's condensed statements run the risk of appearing arbitrary. Chapters 9 and 10 "Analytical psychotherapy" and "Symbol Formation" provide a glimpse of Dr. Fordham's working techniques, which raises more questions than are answered.

FREDA MARTIN

Techniques for Behaviour Change: Applications of Adlerian Theory. 1st Edition. Ed. A. G. NIKELLY. Charles C. Thomas, Springfield, Illinois, 1971, xxx + 224. $10.50.

WHEN I was at the university, there was always an odd sort of vacuum around Adler. Freud we knew, Jung we'd heard of. But who on earth was Adler? So one day I asked the tutor in clinical psychology about the man. The tutor was (and is) a very distinguished psychologist with a gentle, but penetrating mind. "*Adler*", he said, "*Adler, not quite intellectually sound, Adler.*" That was 15 years ago, long enough for any amount of soundness to attach itself to anybody's theory. So how sound do these Applications of Adlerian theory look to me now? Not much change, I'm afraid. I still find the tutor in clinical psychology as penetrating as ever.

On page 39 in "Family Constellation" there is this statement: "The keystone of Adlerian theory is that the child develops those traits that he believes will prove most useful to him in later life." Not on your Freudian, Jungian, Rogerian, Wolperian, Schultzean Nelly he doesn't. Business Corporations do. Military think-tanks do. The Rand Corporation does for a fee. But the child doesn't.

Here we go on "Family Counseling" by Bina Rosenberg: "The counselor should be sensitive to the parents' feelings. . . . " Contrast this with Raymond Corsini in "Group Psychotherapy": "Tears and temper tantrums are only devices . . . . We see them as methods of energizing individuals, or procedures for cowing others, and so on, and in general we ignore feelings as unimportant." Those who collaborate in manifestos should beware of readers with long memories.

Back to "Family Counseling" again: "During a *first* interview (in a child guidance clinic) children may give short answers. . . . Typical initial questions may be: "Why does your mother bring you to this place?" The child's goals are interpreted to him by the counselor in the form of a question: "Could it be that you refuse to dress yourself, to eat . . . because you want mother to help you? Are you trying to boss her?" The child may show a "recognition reflex" by contracting his facial muscles in an involuntary smile

> Oh! Bina Rosenberg. Don't Adlerians ever pause to think? Don't they feel for anything? Don't they watch and observe? Or do they just sit there looking cute and when something runs they shoot it!

On we go, and in "Suicide" we have Nikelly and Karon saying complacently: "Six weeks later, when faced with an apparent break-up of her marriage, she (a suicide threatening patient) telephoned one of the authors to tell him she was about to kill herself. This was immediately interpreted as retaliation: 'There's only one reason anyone kills herself. It's to get even with someone else. But it won't really hurt your husband. . . . ' The client became angry. . . . Nevertheless, she did not kill herself." But what if it wasn't this way at all? What if the *only reason* she had for not killing herself was the pleasurable fantasy of retaliation? And this pro-tem was keeping her alive.

This book shows us a woolly theory and a bold, bashing sort of therapy. It is founded upon simplicistic assumptions, total ego control, ego-directed lifestyles, everything conscious or would be if we made the effort, and sweeping, off the cuff, interpretations. It has the confidence of a syllogistic steam-engine, driven on by good intentions. But it isn't intellectually sound.

D. F. JUNIPER

parent–child separation,
psychological effects on the children

RUTTER, M. (1971) Parent–child separation: psychological effects on the children. J. *Child Psychol. Psychiat.* **12**, 233–260.

ummary—The literature on parent–child separation is reviewed and findings are eported from a detailed and intensive longitudinal study of patients' families. It is oncluded that a child's separation from his family constitutes a potential cause of hort-term distress but separation is of little direct importance as a cause of long-term isorder. Separation experiences have some association with the later development of nti-social behaviour but this is due not to the fact of separation itself, but rather to the amily discord which precedes and accompanies the separation. Both active discord and ack of affection are associated with anti-social disorder but a good relationship with ne parent can go some way toward mitigating the harmful effect of a quarrelsome nhappy home. The association between family disharmony and anti-social disorder is robably largely mediated by environmental influences. Children differ in their response o family discord; these differences are associated with both sex and temperamental actors.

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sex differences, impulsivity,
attainment

GARNER, JOHN, PERCY, LYNDA M. and LAWSON, TOM (1971) Sex differences in. behavioural impulsivity, intellectual impulsivity, and attainment in young children J. *Child Psychol. Psychiat.* **12**, 261–271.

Summary—Inter-relationships between subtests of the WISC, intellectual and behavioural impulsivity were examined separately for boys and girls in an attempt to confirm that impulsivity is differently related to attainment for the two sexes. It was shown that behavioural impulsivity and WISC scores were negatively correlated for boys and positively for girls, and that intellectual impulsivity was negatively related to WISC scores for both sexes. These findings are discussed in relation to Maccoby's theoretical accounts of such differences, and in relation to children's classroom behaviour. Suggestions are made for further research.

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psychiatric disorder, children,
Caribbean immigrants

NICOL, A. R. (1971) Psychiatric disorder in the children of Caribbean immigrants. *J. Child Psychol, Psychiat.* **12**, 273–287.

Summary—The notes of 204 children of Caribbean immigrants attending a Chil Guidance Unit were examined. Those children born in the West Indies were compare with those born in Britain. In addition, a short term follow-up study was carried out A high proportion of disturbed girls and of girls with conduct disorders was found among the West Indian born children. The evidence suggests that, unlike the boys, conduc disorder in the girls is not associated with the disturbance of migration. The possibl aetiology of the disorder is discussed.

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rating scales, disturbed children,
hospital

CUNNINGHAM, MORRIS A. (1971) The reliability of rating scales for assessing the behaviou of disturbed children in a residential unit. *J. Child Psychol. Psychiat.* **12**, 289–304.

Summary—Nineteen children were rated on 24 behaviour traits by ten nurses in children's in-patient unit. The intercorrelations between nurses' ratings showed that number of these traits could be rated with satisfactory agreement. The more obviou forms of difficult behaviour were rated more reliably than traits which were vague o required interpretation of behaviour. Intercorrelations between the traits used suggeste that many of them were related to a factor of aggressive rebellion. Most of the trai related to this factor were rated reliably. Other possible factors such as hyperactivity seclusiveness and anxiety were less well represented among the scales used. The asses ments of anxiety were unreliable.